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Gantsetseg Sanjmyatav*
PhD, Associate Professor
gantsetseg@mandakh.edu.mn
https://orcid.org/0000-0001-9293-027X

Sumiya Tuvdennyam*
PhD, Associate Professor
sumiya@mandakh.edu.mn
https://orcid.org/0000-0003-3683-3576

Oyun-Erdene Erdenebileg*
Senior Teacher
e.oyunerdene@mandakh.edu.mn
https://orcid.org/0000-0001-7207-6547

*Mandakh University
18/1, Amarsanaa str., Bayangol District, 16th Khoroo, Ulaanbaatar City, 16040, POB/ 88, Mongolia

ANALYSIS OF STUDENTS' ATTITUDES TOWARDS E-LEARNING

Abstract. Universities around the world have managed to evolve knowledge production from the physical classroom to virtual education due to the COVID-19 pandemic. Similarly, the vast majority of students in various educational institutions around the world have changed their learning styles to digital learning education. With the regard of the concept that learner's attitude and their learning outcomes have interrelated we have a question that how was the students' attitude developed in the relation of e-learning outcomes. Based on this rational this study focuses on investigating students' attitude through the online education. In this regard, research objectives were designed that 1) to study online learning and Education 4.0; 2) to determine the needs of digital learning, academic motivation and learning outcomes via e-learning; 3) to analyze students' attitudes towards online education. The research data were collected through the tools of questionnaire, observation, covering 380 university students as casual informants and sample interviews from 36 students as key informants in the duration of the academic year 2019-2020. With the analysis techniques, the collected data were categorized according to the objective two in terms of typology such as general information of respondents, E-learning necessities and tools, E-learning involvements, students' attitudes and analyzed by SPSS programs to explore research results systematically. The variables of learning involvement and students individual attitudes were analyzed with crosstab forms to make correlative results. The results of the study indicated that the most students spent 5-12 hours in digital learning, 60% of the respondents have agreed that the E-learning platforms were useful, however, 73.7% of the research informants reported that the learning outcomes were in average. Finally we reached consequence that students' attitudes, in particular individual approach and diligence were developed during online education. The findings of the research were supported by the Ground Theory and Learning Theories and presented by descriptive methods. The research reliability was tested by the triangulation method in terms of cognitive, effective and behavioral dimensions of the attitudes.

Keywords: **E-learning, Academic Involvement, Learning Outcome, Learner's Attitude.**
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Introduction. The pandemic Covid-19 has spread over the world, affecting many aspects of life dramatically. Many countries' educational systems accepted online learning at all levels almost immediately. Nearly 75 countries had executed or announced the shutdown of educa

tional institutions by mid-March 2020. In this sense, to keep academic activities alive, most Mongolian universities have switched to online learning platforms. Both professors and university students have to manage their teaching and learning to adapt to new social, health, and economic situations as an organizational unit. Distance learning was first offered in the 18th century in tandem with the postal service, but it did not gain traction until the 1990s, when communications technology improved. When we examine the stages of education's evolution over time, we can see that, from a traditional system based on books and blackboard teaching, technology has induced a new stage known as Education 4.0, in which the computer and the Internet have changed the concept of education and the new digital generation has provided more educational opportunities. Potential students have been immersed in the digital environment since their early years, and online education, delivered through digital applications, has long been a language of learning for them. The information technologies employed in the academic environment are being redesigned and developed. Multimedia, mobile, and miniature access to information sent by universities will be available in the near future. Academic learning, knowledge domains, and specific disciplines of study all benefit from a strong sense of curiosity.

Students have varying perspectives on online learning. Understanding students' views regarding e-learning can aid in determining the amount to which they use the system. Empowering education to improve innovation, the new stage necessitates the growth and harmonization of educational systems through the establishment of a new relationship: student-teacher-technology = smart education and the usage of e-education (online, electronic tools). The reason for approaching university communication stems from the belief that the way in which information is communicated by universities has a significant impact on students' success in the learning process and their integration into the university environment. As a result, extensive use of e-learning, the need for intellectual and technical knowledge in order to teach using the Internet have emerged in Mongolian educational system. Similarly, advances in information technology and new advancements in learning science are widely acknowledged as providing opportunity to create well-designed, learner–centered, interactive, inexpensive, efficient, and flexible e-learning environments. In this regard, all Mongolian Universities have introduced different types of digital learning technologies to deploy teaching and learning via remote location. The digital learning has affected learners' academic motivation and learning styles. According to the previous studies which focused on students' learning skills, students' technical knowledge and some skills such as information-literate, computer-literate and information processing skills were developed through e-learning. The aim of the paper is to focuse on investigating students' attitude through the online education during the Coronavirus pandemic. In this regard, our research objectives were designed that study online learning and Education 4.0 (Boca, 2021) Education 4.0, as part of the evolution of education but with a strong digital technology influence, is the way of the future. Thus, through this paper, we also tried to determine the needs of digital learning, academic motivation and learning outcomes via e-learning. E-learning has been tightly linked to digital media, which has different approaches in the way of educational practices (Vandana MEHRA, 2012). Empowering education to improve innovation, the new stage necessitates the growth and harmonization of educational systems through the establishment of a new relationship: student-teacher-technology = smart education and the usage of e-education (online, electronic tools). The reason for approaching university communication stems from the belief that the way in which information is communicated by universities has a significant impact on students' success in the learning process and their integration into the university environment.This has expressed that the "forced situation" enables the possibilities of technological advances regarding to digital literacy in higher education in Mongolia.

According to a researcher Gulten Herguner, the individual's desire and approach toward online learning might be defined "It is the individual's attitude towards online learning" (Herguner, 2020). In the view of a researcher Perez Cereijo (2006), students' attitudes toward e-learning can be used to predict learning outcomes. From those studies, the learner's attitude and their learning outcomes have interrelated. With this regard, a clarification that "how was the students' attitude developed in the relation of e-learning outcomes" was questioned for researchers. In order to find an answer for this study we aimed to identify students' attitude through virtual learning.

Literature review. Nowadays, the higher education system is in a continuous process of change, universities having to keep pace with the needs, desires, and requirements of students. Due to its complexity, multiple definitions are proposed for the concept of E-learning.

Apostolia Pange and Jenny Pange define that the concepts of all proposed theories might be included into the design of an online learning system. The principles of behaviorism might be used to educate facts, such as the "what," the principles of cognitivism could be used to teach processes and principles, such as the "how," and the principles of constructivism could be

used to teach causation and more complicated conceptions, such as the "why". (Pange) Similarly, the entire educational procedure should be matched with Active Learning principles in order to excite and sustain vivid learners' attention, which is especially crucial in e-learning environments because the learner has complete control over the learning process. The active production of new knowledge based on a learner's prior experience is characterized by constructivism learning theory. Constructivism learning theory, which focuses on knowledge production based on prior experience, is a suitable fit for e-learning since it ensures learning among learners, according to research. Kaya defined (Cevik, 2021) that Distance education is "The method of conducting out specially prepared educational activities through multiple means connecting teachers and students in circumstances where physical classroom teaching is not possible due to the limits of standard learning-teaching methods". Dikbaş stated that "Unlike traditional classrooms, e-learning allows students to learn at their own pace and make limitless adjustments to course presentations, independent of time or location" (Dikbaş, 2006).

A researcher Gulten defines that Online learning is a learning process (Gulten Herguner, 2020) which students aware learning far from the sources by reaching many learning resources at the same time in an environment different from traditional learning teaching activities. According to Azimi "The notion of electronic learning, or E-learning, has existed for decades and is one of the most important recent advancements in the Information Systems (IS) sector. Web-based learning (WBL), Internet-based training (IBT), advanced distributed learning (ADL), Web-based instruction (WBI), online learning (OL), and open/flexible learning (OFL) have all been used to describe e-learning." The best practices among educational institutions have advised establishing a Web-based learning management system (LMS) (Azimi).

According to Ryan and Deci the theory of academic motivation based on causes of behavior of self-determination. (Mustafa Sevik) Furthermore, theory of Reasoned, action was defined by Davis in 1989, individual's benefits and perceptions affect on learner's attitude towards e-learning. In this regard T.Muthuprasad determined factors affecting the success of online classes under the theme of readiness that includes motivation- goal directed behavior of the learner who possesses self-learning interest.

Muzammal Ahmad highlighted categories referring to good outcomes which include the possibility of developing new resources and fostering academic collaboration. However, time constraints, changes in assessment and consequences for learner's involvement and relationship were the drawbacks. Shu-Sheng-Liaw reported that self-paced, teacher-led, and multimedia instruction are major factors influencing learners' attitudes toward e-learning as an effective learning tool (Shu-Sheng Liawa, 2007).

Online learning is viewed differently by students. Obaid Ullah stated that there is no significant relationship between students' interest in computers, computer usefulness to students, and ease of use of online learning at the undergraduate level. Slow and limited internet access, combined with students' lack of understanding of online learning, frequently results in a negative attitude toward online learning among students. (Obaid Ullah, 2017) According to Roumiana Peytcheva-Forsyth the use of an effective online learning environment with integrated technology for delivering online contact between participants, online assignment submission, and online teacher help might be determined as the students' key ambitions. (Roumiana Peytcheva-Forsyth, 2018) Understanding students' views regarding e-learning can aid in determining the amount to which they use the system. Distance learning was first offered in the 18th century in tandem with the postal service, but it did not gain traction until the 1990s, when communications technology improved. When we examine the stages of education's evolution over time, we can see that, from a traditional system based on books and blackboard teaching, technology has induced a new stage known as Education 4.0, in which the computer and the Internet have changed the concept of education and the new digital generation has provided more educational opportunities. Today's digitally fluent and competitive generations are referred to as digital natives, as these individuals grow up with information and communication technologies (ICT) that they use to participate in a variety of activities (Ilona Valantinaitė, 2020). When compared to traditional classroom-based approaches that are performed face-to-face, educators can now deliver knowledge to students more conveniently using the Internet and media-rich Web applications.

Interest is a driving force for knowledge and attitude, as opposed to motivation. (Anggun Resdasari Prasetyo, 2021) Furthermore, the attitude of obedience to learning activities, both in terms of establishing a study schedule and taking the learning endeavor seriously, is associated with the concept of interest in learning.

Attitudes and beliefs are related, and attitudes and behaviors are linked, according to research in the field of attitude and attitude formation; also, attitudes are generally split into likes and dislikes. (Miliszewska) In fact, if student attitudes are not considered in the educational setting, it may be difficult to wait for learning opportunities. The findings of Ming-Chi

-Lee show that satisfaction has the greatest influence on users' intention to return, followed by perceived usefulness, attitude, concentration, subjective norm, and perceived behavior control as significant but weaker predictors. (Ming-Chi-Lee, 2010)

Hussin defines that Education 4.0 is a response to the demands of IR4.0 (Industrial revolution), in which humans and machines work together to open up new possibilities (Hussin, 2018).

Education 4.0 responds to society's needs in the "innovative era." It's in line with parallelism, connectivism (Goldie, 2016), and visualization's specific properties of influencing behavior. The student must be able to respond to contemporary societal developments with the necessary skills and competencies. This is a new challenge to reinvent Education 4.0, to find clever, creative, and innovative people. (Puncreobutr, 2016) Siti Hajar Halili says that "*In some ways, Education 4.0 completes the phenomena of digital integration in our daily lives, in which humans and machines work together to solve problems, troubleshoot, and, of course, develop new theories of innovation*". Information is pervasive in education 4.0, and the teaching and learning process has evolved into a dynamic process. It is not difficult to imagine what education 4.0 would bring us in light of technology breakthroughs. (Halili, 2019) According to Yalden, a need analysis is a very effective way to determine what the students' requirements are in connection to learning English. The analysis of the target needs should be organized to determine what the students' necessities, wants, and lacks are. (Satria, 2020) Necessities correspond to required knowledge, lacks to current knowledge, and wants correspond to subjective needs. Their study outlined all of the requirements for effective online learning and a guide for teachers in developing appropriate learning materials, technology, and activities for online classes.

Research methodology. In this research, the literature reviews were done in the theoretical framework to define online learning and Education 4.0. The needs of digital learning and learning outcomes via e-learning were investigated analyzing relevant research data. The data were collected through a questionnaire covering 2 weeks in September, 2021 via Google form, an open-free web application, and developed through exploratory research. However, the aim and content of the questionnaire were focused on collecting information which was referred to the academic year of 2019-2020 when the pandemic restriction allowed students to be in lockdown. Totally 380 students were informed as casual respondents via Google and collected data were analyzed descriptively by SPSS. The analyzing data were categorized in general information of respondents, E-learning necessities and tools, E-learning involvements, students' attitudes. The 3rd category which focused on e-learning involvement was concentrate to investigate e-learning processes and its outcomes from the side of students. Then the students' attitudes were analyzed with multiple response method in SPSS. The analysis result of the learning involvement and students individual attitudes were analyzed with crosstab forms to make correlative results. The research reliability was tested by the triangulation method in terms of cognitive, effective and behavioral dimensions of the attitudes. The research findings were supported by the Ground and learning theories.

Table 1. Respondents' general information

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16-20	116	30.5	30.5	30.5
	21-25	248	65.3	65.3	95.8
	26-30	12	3.2	3.2	98.9
	31 and up	4	1.1	1.1	100.0
	Total	380	100.0	100.0	

Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	116	30.5	30.5	30.5
	female	264	69.5	69.5	100.0
	Total	380	100.0	100.0	

Course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Freshman	4	1.1	1.1	1.1
	Sophomore	108	28.4	28.4	29.5
	Junior	156	41.1	41.1	70.5
	Senior	112	29.5	29.5	100.0
	Total	380	100.0	100.0	

Main results. In a very short time, (during the Coronavirus pandemic), universities had to adapt in the educational process E-Learning. The data analysis, according to the research purpose, has revealed the following results and described with interpretive explanations.

The population comprised of 380 university students in the study when a questionnaire was conducted through Google Form, web-based free application. 368 students out of 380, which accounts for 90.8% of the total population, who are at the age between 16-25, were considered as the main informants because of occupying the dominant numbers of participation. In a clarification of the term 'course' it has meaning that what year student participated in the surveys as respondents. The sophomores, juniors and seniors were informed actively as their numbers were over 100, as 108, 156 and 112 respectively. It can be seen in the table 1, that those students' responses can be more significant to explore the reliable results with the reason of they have been attended online course in the 3rd year during the pandemic.

In this part the study was focused on definin total time which is dedicated for online courses both virtual classes and assignment works, and tools which are used e-learning. By exploring these two variables we supposed to identify e-learning necessities in terms of total time for virtual learning and tools were used, which would affect to e-learning outcomes. Therefore, the table 2 illustrated that 276 informants, 72.6 in percentage which were considered as the majority of the total informants, represented that the most students spend between 4 and 6 hours for online classes. Furthermore, 176 and 165 in total 340 students expressed that they spent 1 to 3 and 4 to 6 hours for assignment per day, respectively. This result indicated that the time for virtual classes and assignment are fluctuated between 5 and 12 hours a day. It expressed that most students affirmed that they have needs for additional time to collect data and learning materials for their study in order to do homework and other assignment catch up. This inferred that the online courses need a lot of time to manage for learning.

In terms of frequent learning tools, the cellphone is the most useful device which was shown in 91.6 %. According to the random-interview the reason of using cellphone was detected that it has the easiest access virtual learning because of carrying easily and having low price in data use. However, the laptop was less used in particular virtual classes in contrast it was only in some occasional cases such as progress and final exams according to the interviews.

Students' involvement was shown in the table 3, which was determined by the aspects of learning platform, processes and outcomes, all were evaluated on average. In detail, 56.8% of respondents stated that E-learning platforms were easy to follow and productive after the students were fully aware of the access. It inferred that the platform access had somewhat adverse effect to E-learning process, which was accounted in 73.7% and the learning outcome resulted in 74.7% as an average in terms of quality.

Table 2. E-learning necessities and tools

Hours in online class per day

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-3 hours	68	17.9	17.9	17.9
	4-6 hours	276	72.6	72.6	90.5
	7 and up	36	9.5	9.5	100.0
	Total	380	100.0	100.0	

Hours for assigment per day

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	between 1-3 hours	176	46.3	46.3	46.3
	between 4-6 hours	164	43.2	43.2	89.5
	up to 7 hours	40	10.5	10.5	100.0
	Total	380	100.0	100.0	

Use of cellphone to access online class

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	348	91.6	91.6	91.6
	no	32	8.4	8.4	100.0
	Total	380	100.0	100.0	

Use of laptop to access online class

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	180	47.4	47.4	47.4
	no	200	52.6	52.6	100.0
	Total	380	100.0	100.0	

Table 3. E-Learning Involvement

Overall quality of E- Learning platform

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High	156	41.1	41.1	41.1
	Average	216	56.8	56.8	97.9
	Low	8	2.1	2.1	100.0
	Total	380	100.0	100.0	

Quality of E-Learning process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	high	88	23.2	23.2	23.2
	average	280	73.7	73.7	96.8
	low	4	1.1	1.1	97.9
	4.00	8	2.1	2.1	100.0
	Total	380	100.0	100.0	

Quality of E-Learning outcome

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High	88	23.2	23.2	23.2
	Average	284	74.7	74.7	97.9
	Low	4	1.1	1.1	98.9
	4.00	4	1.1	1.1	100.0
	Total	380	100.0	100.0	

However, according to the sample interviews, there were some positive effects to the learning outcomes, in particular developing the platform with supplementary sources, for instance, some attractive and practical tasks were provided for students to work in teams, various links with relevant references were posted and some short videos under the particular topics were made for learners. In brief summary, there were some factors to e-learning outcomes such as lack of online experience both in teachers and learners for developing the e-learning access with academic collaboration and being focused and concentrated on virtual learning environment.

Students' attitudes towards e-learning were analyzed with the multiple response frequencies and resulted differently as illustrated in the table 4. The individual desire /diligence/ and independent attitudes were developed with the vote of 27.2% and 31.5% respectively. It can be seen that these attitudes were formed on the base of the learning needs which students spent no more than 1-6 hours per day during online courses. That also means e-learning allows students to learn at their pace and make limitless adjustments to their course work and presentations. In contrast, the attitudes being confident and self-expression (doubtfulness) mode were less developed as estimated in 11.4% and 15.2% in each case. The reason is be related to the learning outcomes which were evaluated in average in terms of quality. Similarly, students also found out improving their E-Learning experience such as time-management, discipline to be diligent during the online education. In summary, the concept that the individual's benefits and perceptions through e-learning are affected on learner's attitude, was supported by the Ground Theory.

Table 4. Students' attitudes towards E-Learning

Attitudes Frequencies				
		Responses		Percent of Cases
		N	Percent	
13a[a]	individual approach	108	14.7%	28.4%
	confidence	84	11.4%	22.1%
	independence	232	31.5%	61.1%
	individual desire	200	27.2%	52.6%
	doubtfulness	112	15.2%	29.5%
Total		736	100.0%	193.7%

a. Group

Table 5. Students' attitudes through correlative analysis

Course * Quality of E-Learning process * Individual approach Crosstabulation

Individual approach	Quality of E-Learning process			Total
	high	average	don't know	
Freshman	1	0	0	1
Sophomore	22	10	0	32
Junior	0	40	0	40
Senior	0	31	4	35
Total	23	81	4	108

Course * Quality of E-Learning process * Confidence Crosstabulation

Confidence	**Quality of E-Learning process**			Total
	high	average	low	
Freshman	2	0	0	2
Sophomore	19	6	0	25
Junior	0	35	0	35
Senior	0	21	1	22
Total	21	62	1	84

Course * Quality of E-Learning process * Individual independence Crosstabulation

Individual independence	**Quality of E-Learning process**				Total
	high	average	low	don't know	
Freshman	3	0	0	0	3
Sophomore	52	13	0	0	65
Junior	0	95	0	0	95
Senior	0	62	3	4	69
Total	55	170	3	4	232

Course * Quality of E-Learning process * Individual desire Crosstabulation

Individual desire	**Quality of E-Learning process**				Total
	high	average	low	don't know	
Sophomore	47	10	0	0	57
Junior	0	86	0	0	86
Senior	0	50	3	4	57
Total	47	146	3	4	200

Course * Quality of E-Learning process * Doubtfulness Crosstabulation

Doubtfulness			Quality of E-Learning process				
			high	average	low	don't know	Total
doubtfulness	Course	Freshman	1	0	0	0	1
		Sophomore	24	5	0	0	29
		Junior	0	48	0	0	48
		Senior	0	30	1	3	34
	Total		25	83	1	3	112

These tables, in a whole, have expressed the correlative relations between the variables of different courses and e-learning outcome towards various types of attitudes. According to the research analysis, the e-learning outcome was resulted in average as 74.8% that were accounted 550 votes out of 736 informants. This result has implicated that e-learning processes were carried out with an average expectation at their own pace of learning conditions, regardless of time and place.

In terms of attitudes, the individual independence of senior students was accounted in 76% as the highest among juniors and sophomores. This means that independent attitude of students has been developed year by year as they till engaged in the 4th year. The attitude of being desired to learn individually and confident were motivated among juniors, who are qualified professionally, as presented by 55.1% and 22.4% respectively. The results have shown that the qualifying subjects are considered as an important impact to be responsible for their study in the context of forming creative professionals. While, the attitudes like individual independence, diligence, individual approach and confidence among sophomore were developed less than juniors and seniors as shown in the tables. This has expressed that the learning attitudes are formed during the process of study.

Conclusion.

1. Educational section is not prepared for the sudden shift to exclusively online learning that meet the new challenges Universities. Students were encouraged and motivated in order to adapt to the new diversified learning condition as a result of E-learning platforms and technological applications were productive.

2. However, the quality of the E-Learning outcome was average, students could improve positive attitudes towards individual study experience such as how to interact with and build up an online relationship, enhance their technical literacy, furthermore time-management, self-motivation and discipline were affected to be diligent during E-Learning.

3. Students' behavioral attitudes were dominantly developed rather than the effect, cognitive through this study. Students' positive attitudes such as being diligent and independent were more developed and formed when they study in the junior and senior courses.

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Ганцецег Санжмятав*, доктор філософії з економіки, доцент
gantsetseg@mandakh.edu.mn https://orcid.org/0000-0001-9293-027X

Сумія Тувдення*, доктор філософії з економіки, доцент
sumiya@mandakh.edu.mn https://orcid.org/0000-0003-3683-3576

Оюн-Ердене Ерденебілег*, старший викладач
e.oyunerdene@mandakh.edu.mn https://orcid.org/0000-0001-7207-6547

*Мандахський університет
вул. Амарсана, 18/1, район Баянгол, 16 Хороо, Улан-Батор, 16040, РОВ/ 88, Монголія

АНАЛІЗ СТАВЛЕННЯ СТУДЕНТІВ ДО ЕЛЕКТРОННОГО НАВЧАННЯ

Через пандемію COVID-19 університетам по всьому світу вдалося розвинути виробництво знань від фізичної аудиторії до віртуальної освіти. Так само переважна більшість студентів

різних навчальних закладів по всьому світу змінили свої стилі навчання на цифрову освіту. Щодо концепції того, що ставлення учня та їхні результати навчання взаємопов'язані, у нас виникає питання, як розвивалося ставлення студентів щодо результатів електронного навчання. На основі цього це дослідження зосереджено на виявленні ставлення студентів до онлайн-освіти. У зв'язку з цим були поставлені завдання дослідження: 1) вивчити онлайн-навчання та Освіту 4.0; 2) визначити потреби цифрового навчання, академічної мотивації та результатів навчання за допомогою електронного навчання; 3) проаналізувати ставлення студентів до онлайн-освіти. Дані дослідження були зібрані за допомогою інструментів анкетування, спостереження, охоплення 380 студентів університету як випадкових інформаторів та вибіркових інтерв'ю з 36 студентами, як ключовими інформаторами, упродовж 2019-2020 навчального року. За допомогою методів аналізу зібрані дані були класифіковані відповідно до двох цілей з точки зору типології, таких як загальна інформація респондентів, необхідні засоби та інструменти електронного навчання, залучення до електронного навчання, ставлення студентів та проаналізовані програмами SPSS для вивчення результатів дослідження. Змінні залучення до навчання та індивідуальне ставлення студентів були проаналізовані за допомогою перехресних таблиць, щоб отримати корелятивні результати. Результати дослідження показали, що більшість студентів витрачали 5-12 годин на цифрове навчання, 60% респондентів погодилися, що платформи електронного навчання були корисними, однак 73,7% респондентів дослідження повідомили, що результати навчання були середніми. Нарешті ми дійшли до того, що під час онлайн-навчання розвивалося ставлення студентів, зокрема індивідуальний підхід та старанність. Висновки дослідження були підкріплені базовою теорією та теорією навчання та представлені описовими методами. Надійність дослідження була перевірена методом тріангуляції з точки зору когнітивного, ефективного та поведінкового вимірів установок.

Ключові слова: **електронне навчання, академічна участь, результат навчання, ставлення учня**.

JEL Classification code: I00; I2; I21.

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