Demand and Learning Environment to Provide English-Language Learning at Technical Universities in Ukraine

Yurii Konovalenko[0000-0001-7548-5872], Svitlana Garkavenko[0000-0002-4504-474X], Tetiana Derkach[0000-0003-1087-8274] and Oksana Morgulets[0000-0001-6530-1478]

Kyiv National University of Technologies and Design,
2 Nemyrovycha-Danchenka Str., Kyiv, 01011, Ukraine
hardkonovalenko@gmail.com, garkavenko.s@knutd.edu.ua,
derkach.tm@knutd.edu.ua, morgulets_oks@ukr.net

Abstract. The paper aimed to study the readiness of the existing e-learning environment for the organisation of English-language learning among Ukrainian and international students on the example of a technical university in Ukraine. The need for English-language training was explored by interviewing students with keen interest, level of English proficiency, motivation, preferred forms of learning, and a willingness to incur additional costs for such learning. About two-thirds of those surveyed showed interest in English-language education. About one-third of the students surveyed have the necessary level of preparation and are also prepared for additional financial expenses. About one-third of the students may also join English-language studies if they fulfil specific prerequisites. Expected employment progress is the primary motivation for joining the English-language program. The readiness of the existing learning environment was tested by analysing the organisation of access to English-language teaching materials, assessing the demand for different electronic resources, as well as the ability to take into account the learning styles of potential Ukrainian and international students in the educational process.

Keywords: Electronic Learning Environment, English-Language Learning; Learning Style

1   Introduction

Learning environments imply any places where students strive for their academic goals. Therefore, this term includes teaching strategies and methods, learning technology and resources, means of teaching, including technical aids, modes of learning, and connections to societal and global contexts [1-3]. In other words, the learning environment represents the current spatial, temporal and social learning situation. The term also includes the relevant cultural context and human behavioural and cultural dimensions, including the vital role of emotion in learning. Therefore, the learning environment consists of both human practices and material systems. The situation is similar to ecology, which is usually considered as a combination of living things and the physical environment [4].

Currently, learning environments have extended from the physical to the virtual and mobile due to the extensive use of information communication technologies (ICT) and the Internet which both transformed learning and teaching in the academic world [5-9]. The implementing ICT activity is expending from the enhancement of learning, as was at the first stage, to the involvement in a learning process of completely new factors. They are not reduced to hardware, software, and the network. The use of ICTs can improve the quality of education by increasing motivation and engagement of learners, facilitating the acquisition of basic skills and enhancing teacher training [10, 11]. ICTs can promote the shift to a learner-centred environment, which is today the primary benchmark for changing the learning paradigm.

The main goal of institutions of higher education (IHE) is to provide high-quality training of future specialists. At Kyiv National University of Technologies and Design (KNUTD), the management system for IHE (MS-IHE), integrated with a quality management system (QMS), manages various aspects of daily educational activity [12-14]. Such integration simplifies planning, allocating resources, identifying new goals, and evaluating the overall performance of the institution.

In turn, the QMS is based on the automated control system (ACS), which was developed to manage data flows and control automation of all processes occurring at KNUTD. The objects of the QMS are the main components of scholarly activity: resources, educational processes and their outcomes

The ACS includes a few subsystems. In particular, the modular environment of the educational process (MEEP) is functioning at the KNUTD [12, 13]. The MEEP provides all necessary teaching and methodological support of the educational activities. It is realised an object-oriented dynamic learning environment on the base of the free learning platform for the organisation of distance education Moodle. The Moodle is the most common LMS for the organisation of e-learning in universities of Ukraine [15, 16].

The MEEP, operating at KNUTD, has been developed and optimised for use in the Ukrainian-language environment. At the same time, there are new challenges associated with changing the paradigm of the learning organisation. The main focus of the day is on student-centred learning. In other words, this means maximum consideration of the wishes or requirements of all stakeholders such as clients of the service (students) and customers of the graduates (employers).

One such requirement is the growing demand for English language training. Today, however, virtually none of the country's national universities has well-developed English-language educational programs, except for some narrow medical and technical fields [17, 18]. There is a potential demand for this type of educational services both among Ukrainian-speaking and English-speaking populations.

The trend of increasing demand for English-language education is familiar to many countries in the world [19, 20]. In 2002, EU universities offered 560 master's programs taught in English. As of June 2013, there were 6407 programs [21]. That is an increase of more than ten times compared to 2002 and 38% more than in 2011. The undisputed leadership here belongs to the Netherlands, Germany and Sweden. As for the disciplinary distribution of these programs, the clear leaders are English-language masters programs in business and economics (28%) and engineering (21%) [21].

The lack of English-language education programs also contributes to the outflow of Ukrainian students to study abroad. In the period 2013-2017 the number of Ukrainian citizens in the Polish universities tripled, in Spain, Italy and Canada doubled, and in the Czech Republic, Austria and the United Kingdom increased by 41% [21].

Besides, students from other countries may be interested in receiving English language education in Ukraine. For example, about 52% of Asian students are educated abroad. Students from China, India, Korea (up to 77% of the total number of such students) are on top of that [21]. Of course, if English-language education programs were introduced, a significant percentage of the immigrants from these countries would choose our IHEs, given their economic attractiveness.

There is also a demand for English-language teaching services from both international and Ukrainian students [22, 23]. All they would like to expand their prospects for further study abroad or employment. However, the question arises as to whether the existing learning environment responds to the new challenge? There is also little information about the students' current concerns about organising English-language training. The purpose of this paper was to investigate the compliance of the existing learning environment at KNUTD with the modern requirements and wishes of stakeholders in the provision of English-language training.

The paper goal is achieved by solving the following research problems: i) investigation of students' real demand concerning English-language learning, ii) identification of the problematic areas in the existing e-learning environment, and iii) exploration of how the existing system can be adapted to provide English-language learning.

The first task will be solved by conducting a survey of Ukrainian university students and analysing the results obtained in terms of distribution by years of study, faculties and forms of study.

Besides, the question remains how easily the existing learning environment can be adapted to the needs of English-language learning. First of all, this issue concerns the organisation of learner-centred learning, as well as the provision of students with English-language teaching materials.

Friendliness of the existing learning environment to the personal characteristics of students and openness to the adaptation will be clarified by studying the preferred learning styles of Ukrainian and international students. The supply of English-language textbooks to the library is limited primarily for economic reasons. Therefore, the use of e-resources (lecture notes, presentations, study guides, etc.) and the organisation of their access through the learning environment is a top priority.

2 Methods and materials

2.1 Survey methodology

In total, 1414 students of the first-to-fourth courses of six faculties of KNUTD were interviewed. First-year students enrolled at the university in 2019, 4-year students – in

2016. The distributions of respondents by Faculties together with Faculties' names (including abbreviations) and courses of study are given in Table 1.

Table 1. Number of students who participated in the survey

Faculties / Course	1	2	3	4	Total
Design (D)	82	70	63	85	300
Economics & Business (EB)	134	48	65	116	363
Fashion Industry (FI)	26	41	57	68	192
Mechatronics & Computer Technologies (MCT)	61	19	42	57	179
Entrepreneurship & Law (EL)	71	22	17	22	132
Chemical & Biopharmaceutical Technologies (CBT)	47	42	72	87	248
Total	**421**	**242**	**316**	**435**	**1414**

The purpose of the survey was to identify the attitude of students to the opportunity to undergo English-language training at KNUTD, depending on their age and field of study. All questions of the questionnaire were divided into five clusters and concerned the following topics:

1. identification of students (gender, faculty, course and form of study);
2. financial support (assessment of current financial status and availability of scholarships and additional sources of funding);
3. level of command of a foreign language;
4. motivation to take part in English-language learning, and
5. foreign language skills and English-language learning preferences, including financial aspects. The last block of questions was the most extensive and essential, as it allowed ones to assess students' existing needs for English language training.

The data obtained will be presented in relative units (percentages) to neutralise the potential impact of different numbers of students on faculties or courses. The number of students in any sample will generally be attributed to the total number of students studying English. When studying a graduate school, the number of students, who have expressed an interest in postgraduate studies will be used as a benchmark.

2.2 The methodology of testing of existing electronic learning environment

The most important details of the MEEP functioning at the KNUTD in the context of the considered problems are as follows. Lecturers create electronic teaching and learning complexes (ETLC) of all disciplines to fill the MEEP with necessary information. An ETLC can include a syllabus and scheduled work program of a subject. Also, it contains electronic textbooks, lecture notes, study guides and various tutorials. They can be presentations, dedicated videos, dictionaries and glossaries, reference books, etc. Similar systems were frequently described in the literature [11, 24].

The improvement of the quality of educational activities of the university is the main advantage of the implemented MEEP. Maintenance of permanent

communication between participants of the educational process demonstrates the effectiveness of MEEP use for all forms of learning. Teachers and students can communicate in a web-classroom environment with tutors, supervisors, an administrator-consultant and other members of the group through an online-chat or offline-email. Such tools as graphic chat, forum, bulletin board, testing, etc. are also actively used.

The existing learning environment allows the use of e-learning resources. However, these resources are known to be sensitive to personality traits. They may, therefore, be useful for some students and ineffective for others. Such a situation is best reflected by the known correlations between students' learning styles and attitudes towards e-learning resources or progress in studies [25]. The introduction of English-language learning, including the training of international students, actualises the issue of preferred learning styles among students of different groups.

Therefore, the differences in the learning styles are analysed for students of different specialities and nationalities studying at KNUTD. The preferred styles of Ukrainian students of some specialities are compared between each other, as well as with the learning preferences of Chinese students. Chinese students are selected because they are studying in an English-speaking environment at a joint Ukrainian-Chinese educational institution, Kyiv College. This institution is founded by KNUTD and the Qilu university at the Jinan City of Shandong Province.

The survey was conducted to identify the preferred learning styles of students. The instrument, known as Index of Learning Style (ILS) and developed by Richard M. Felder and Barbara A. Soloman (thereinafter Felder-Soloman's model) [26, 27] was used. Respondents were interviewed to respond to 44 questions and estimate available preferences in four complementary dimensions. The instrument categorises individuals in line with their preferences in perception – sensing (sen in short) or intuitive (int), input – visual (vis) or verbal (vrb), processing – active (act) or reflective (ref)) and understanding of information – sequential (seq) or global (glo). The application of Felder-Soloman's model to students of different study areas was described in detail elsewhere [28, 29].

The existing learning environment allows optimising the use of e-resources according to individual preferences. Then the ease accessibility of e-resources for English language programs becomes an essential issue. Organising access to paper copies through the library significantly increases the cost of English-language learning. Therefore, having a full range of necessary resources in electronic forms is critically important. This paper analyses available statistics of students' accesses, normalised by the number of involved students, to e-resources related to the teaching of some special subjects at the Department of Professional Education in Technologies and Design. The dynamics of data retrievals in 2017-2019 are analysed for selected subjects and resources. Such analysis is necessary to test the preparedness of the existing learning environment to the introduction of English-language teaching and learning.

3 Results

3.1 Questionnaire results

The questions asked in the survey relate to the prerequisites for English-language learning, the dominant motivation of students and the student's preferences regarding the organisation of English-language learning, including financial aspects. The fundamental prerequisite for the organisation of English language training is the level of English proficiency among students. According to the Common European Framework of Reference (CEFR), learners' knowledge is divided into three groups (A, B, C), each of which is divided into two groups (Levels 1 and 2).

Students were asked to evaluate their knowledge according to this system. The questionnaire contained a detailed description of the requirements specific to each level of knowledge. Levels B and C, corresponding to an independent possession (Independent User) and free possession (Proficient User) were regarded as sufficient for mastering knowledge in English-language training. Therefore, the data for these levels were summarised, which simplified the overall picture.

Level A (Basic User) splits into half level A1 or survival level (Beginner and Elementary) and A2 (Pre-Intermediate level). It is usually insufficient for understanding lectures in a foreign language. However, the level A can be considered as a basis, which can be improved to the required minimum level B in the shortest time. The results of the survey are presented in Fig. 1 in the context of courses and faculties.
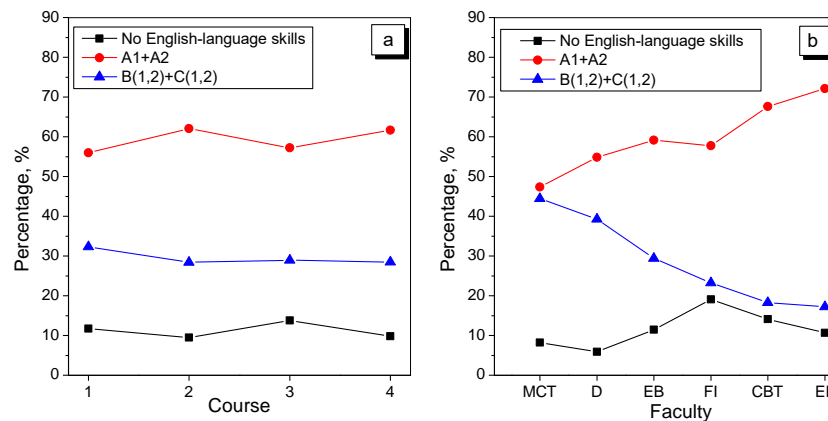

Fig. 1. Proficiency level in English language depending on course (a) and faculty (b)

Note that among university students, 89.6% studied English in the school. In comparison, all other foreign languages accounted for a total of about 10%.

Among those who studied English, about 10-13% said that their knowledge was at a zero level. This indicator remains stable for all courses (Fig. 1a). About 30% among the remaining students declare knowledge at level B or C; 60% (most) – at level A. Therefore, a third of students are well prepared for the perception of English-language

education. About 60% can reach this level after some preparation.

Unlike the distribution of courses, the distribution of knowledge between faculties is less uniform (Fig. 1b). The maximum values of untrained students are observed for FI (about 19%) and minimum for D (8%). In comparison, the value of untrained students varies within 10-13% in other faculties. On MCT and D, knowledge at the B + C level has 30-40% of students, and the number of students who do not have sufficient knowledge is about 6-8%. In contrast, only 20% are with the knowledge of B + C at the Faculties of FI, CBT, EL and EB. The number of students who do not know the language is maximum in comparison with other faculties. The decrease in knowledge at the B + C level from faculty to faculty is usually offset by an increase in the share of students with knowledge at level A (Fig. 1b).

Thus, there are potentially large numbers of students who have the required level of preparation for English language training. However, for such a transformation to be successful, it is necessary to understand how many students really want English language training. The results of the survey on this issue are shown in Fig. 2.
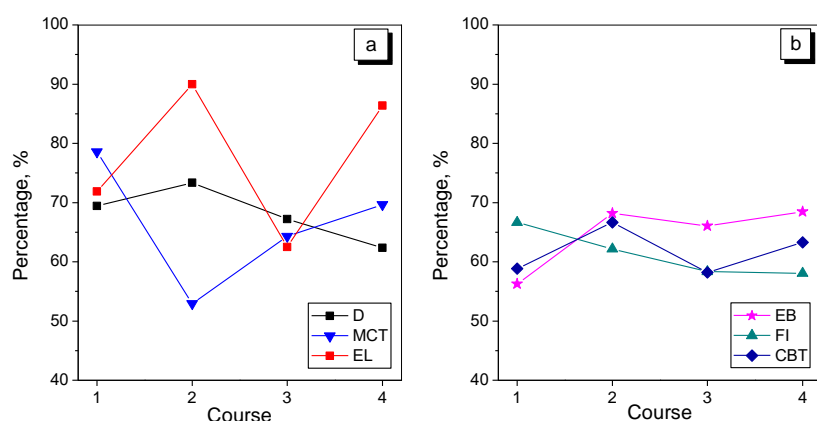

Fig. 2. The relative number of students who want to study English for students of 1-4 courses at different faculties: a – MCT, D and EL, b – EB, FI and CBT

The KNUTD average is almost 66%, while the results for different courses vary in a wide range of 55% and 90%. For most faculties (Fig. 2b), the research indicator remains relatively stable and slightly dependent on the course.

For two faculties, namely MCT and D (Fig. 2a), fluctuations from course to course are more significant. The MCT, EL and D rates, shown in Fig. 2a, are on average slightly higher (above 68%) than at other faculties illustrated in Fig. 2b (less than 64%).

At least two-thirds of the students surveyed are interested in English-language training. Four questions were formulated in the survey to identify the real motivation of the respondents. Two questions concerned the assessment of views on further employment, and two on possible ways of further education (Fig. 3).

Overall, according to the respondents, learning English is more necessary for further employment (Fig. 3a). Thus, in fact, 100% of students, who have shown

interest in English-language studies, are simultaneously considering for themselves employment abroad. At the same time, about 80% of respondents do not rule out intentions to start their businesses. Regarding further education (Fig. 3b), only 40-60% of those interested in learning English has the advantage of possible study abroad. However, among those who are considering admission to graduate school. 90-100% recognise the need for English language training.
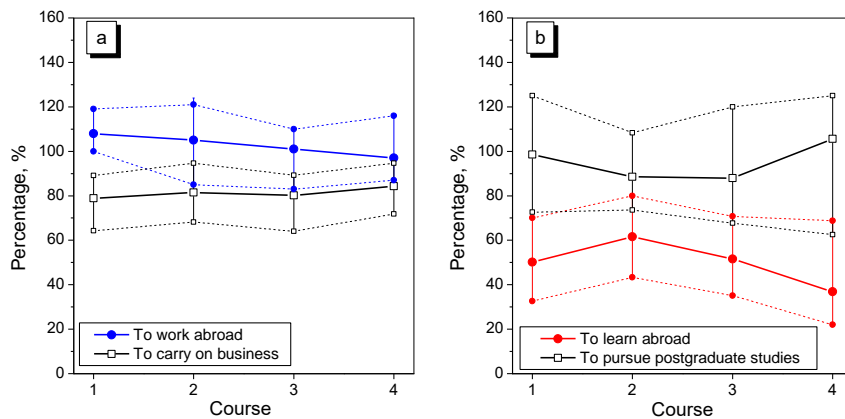

Fig. 3. The motivation for English-language learning: a – motives for employment, b – motives for further learning

An important aspect is the study of the forms of English-language teaching that most meet the expectations of the respondents. The survey suggested identifying the available preferences concerning four forms of training (Fig. 4).
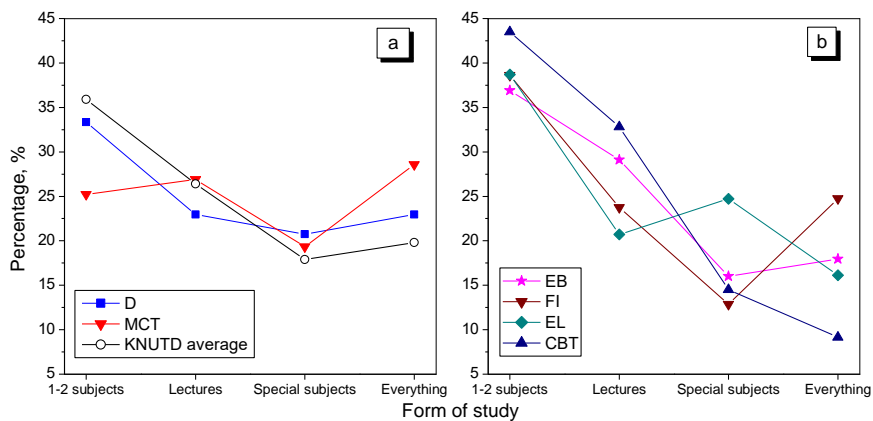

Fig. 4. Available preferences in learning forms

The most relaxed mode is to teach 1-2 subjects in English and continue to use Ukrainian in teaching other disciplines. An alternative model is to introduce English-

language teaching for 100% of the subjects. Two intermediate forms include teaching special subjects in English and fundamental subjects in Ukrainian or giving lectures in English and teaching practical classes in Ukrainian.

The most relaxed model for the gradual introduction of English-language teaching is somewhat prevalent over others for all faculties (Fig. 4). However, the difference in preferences over more fundamental models of teaching is small in those faculties (MCT and D) whose students declare a little better knowledge of languages (Fig. 4a). For example, MCT students did not actually find a preference for any learning models, each accounting for 20-28% of the total.

If students show a slightly lower level of language proficiency (four other faculties), up to 35-45% favour partial English-language teaching. For example, only 10-20% are supporting a full transition to English teaching (Fig. 4b).

Currently, students of Ukrainian universities study both for free on a paid basis. In the first case, education costs are covered from the country's budget (from now on referred to as the budget students). In the second case, there are concluded contract between a university and a student (contractual education). In conditions of limited public funds, an essential issue for the introduction of English-language education is the willingness of students to use the contracted form of education. The survey results are shown for all students (Fig. 5a) and separately for budgetary and contractor students (Fig. 5b).
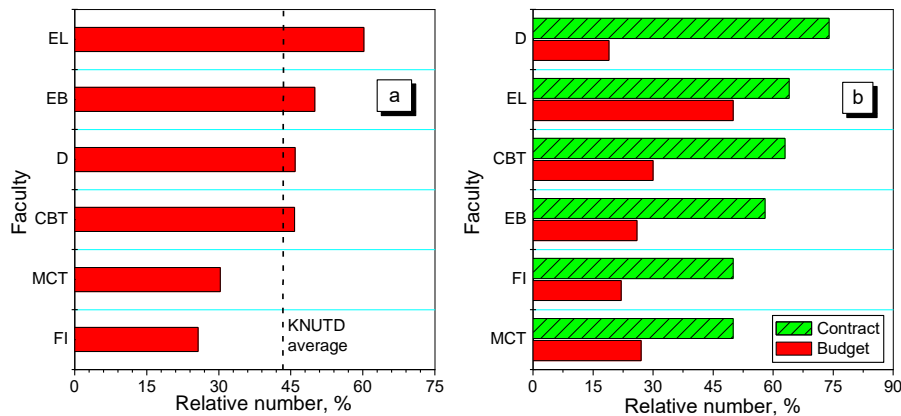
Fig. 5. Distribution of willingness to pay money for English-language learning by faculties (a) and by forms of education (b)

On average, about 43% of all English-speaking students are ready to introduce English-language training on a contractual basis (Fig. 5a). This indicator varies from 60% (Faculty of EL) to 25% (Faculty of FI) for different faculties.

It is not surprising that the number of students who approve of paid English-language studies is much higher among those who study on a contract basis (Fig. 5b). The difference between the contractual and budgetary students is almost four times for the Faculty of Design and is only 30% for Faculty of Entrepreneurship & Law. For other faculties, this difference is stably on a level of 2-2.5.

3.2 Preferred learning styles

Figure 6 illustrates some results of the study of learning preferences for students of different specialities at KNUTD. A good coincidence of learning preferences is observed between Ukrainian students studied pharmacy and chemistry at the KNUTD (Fig. 6a). Students are mainly characterised by active (71-73% of all students), sensing (82-83%), visual (78-81%) and sequential (64-71%) styles.

All these indicators are typical for students of the natural fields of studies [30]. It was also shown in previous works [30] that the learning profiles of undergraduate students remain practically unchanged during the studies in baccalaureate, demonstrating the stability of the educational preferences gained.

On the other hand, a significant difference exists between the profiles of Ukrainian design and technology students of the KNUTD and Chinese technology students of the Kyiv College at Jinan (Fig. 6b). The domination of visual style over verbal style (85% vs 15%) and moderate prevalence of active and sequential styles (65% vs 35%) compared to ref and glo styles, respectively, are typical for Ukrainian students.
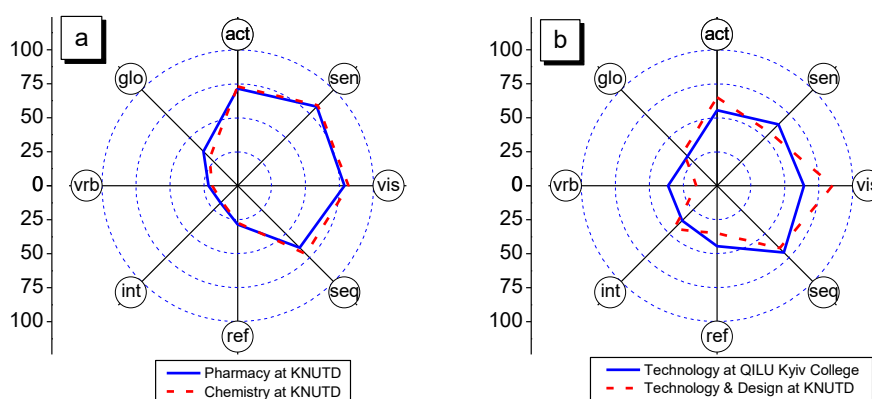

Fig. 6. Preferred learning styles of students of different fields of study

In contrast, Chinese students are significantly more verbal (36% verbal students compared to 64% visual) compared to Ukrainian students of similar specialities (15% verbal vs 85% visual). They are also a bit more reflective: 44% and 56% of Chinese students at Kyiv College are reflective and active, respectively (Fig. 6b). In comparison, the same results for Ukrainian students are 35% and 65% (Fig. 6a).

In dimensions seq-glo and sen-int, the measured difference between Chinese and Ukrainian students is minimal; it never exceeds 5%.

In general, students specialised in technology exhibit a more balanced profile of learning preferences compared to students of natural fields of study.

From a practical point of view, the identified difference in learning preferences must be taken into account. In particular, when developing educational materials and organising the English-language training for students of Ukraine and China. Such an adjustment can be made using the existing MEEP system. The flexibility and

sensitiveness of this system will be partly verified in the following paper section.

3.3   Access to e-resources within the existing learning environment

Another aspect that requires research in the context of English-language learning is the adaptability of the existing electronic environment to the changes that are needed. One such change is the need to provide students with English-language learning materials. Such a task cannot be solved within the traditional approach, which relies solely on printed matters but requires the involvement of several e-resources. It should also be remembered that the effectiveness of the use of e-resources depends on consistency with the preferred learning styles [25]. In turn, as already shown, learning styles of students of different fields of study backgrounds can vary widely.

Therefore, it is of interest to study the characteristics of existing e-resources, organise access to them within the existing MEEP system, and the popularity of various resources among students. The existing MEEP system allows one to study resource demand and the ease of access to it by examining the number of resource requests over several years of study.

As an example, the characteristics of e-resources used in the teaching of a few special subjects at the Department of Professional Education in Technologies and Design (Faculty of Fashion Industry) were investigated over the last three years.

The full and short names of the disciplines are as follows: imagology and the basics of engineering and pedagogical creativity; communicative processes in pedagogical activity; professional training methods; professional pedagogy; creative technologies of teaching.
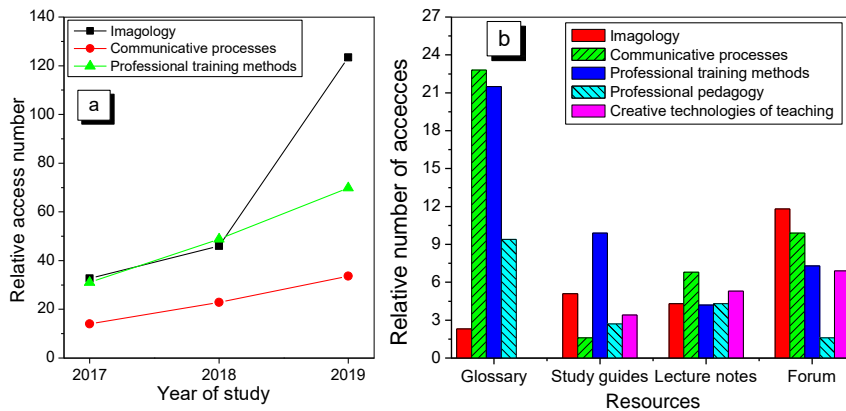
The results of the study are shown in Fig. 7.

Fig. 7. The number accesses, normalised to the number of students, to available e-resources of the Department of Professional Education in Technologies and Design: a – average yearly accesses to all resources of the discipline; b – average yearly accesses to some individual resources of various disciplines

Figure 7a illustrates the dynamics of data retrievals for all resources available for each of the three randomly selected disciplines since their publishing in the MEEP system. Two findings are apparent. First, the average number of data retrievals is increasing, which indicates a growing demand for resources. Second, the figures for different disciplines are noticeably different. Among the reasons may be the varying resource numbers and quality, compliance with prevailing learning styles, the particularities of teaching discipline, etc. In any case, more research is necessary to answer the question definitively.

Figure 7b illustrates the frequency of accesses to individual resources averaged throughout 2017-2019. Some less popular resources, such as training programs, materials for practical and independent work, control issues, recommended literature lists, etc., are excluded from the analysis. Some resources have been merged. For example, lectures include lecture notes, e-books & presentations, and dedicated videos. The results obtained are also characterised by high data divergence. However, in general, they indicate the popularity and high demand for available resources.

4   Discussion

An analysis of the results obtained indicates the availability of a sufficient resource for those wishing to organise English-language training. Such a conclusion is based on the following identified facts.

1. 90% of students studied English at school.
2. Among them, 30% of students have a sufficient level of knowledge, such as levels B and C, according to CEFR.
3. Up to 60% more can relatively easily and quickly reach the required level. These students must improve their proficiency from level A to level B.
4. About two-thirds of those who study English are interested in introducing English-language instruction. Despite some variability of the results, in general, the indicators of KNTUD are quite homogeneous in faculties and courses.
5. The motivation for English-language training is primarily connected with the opinion that such training will contribute to career growth.
6. Language proficiency influences the priority model of learning. The faculties, where students have better knowledge on average, do not deny more radical models of English-language teaching. A more cautious attitude towards different models of learning prevails at faculties where knowledge is weaker than in others.
7. The fact that about 43% of the number of students consider English language teaching on a contract basis is significant. More loyal to this model were students of the contract form of study. Among them, the number of students who agree to pay tuition is 1.5-4 times higher than among budgetary students.

The understanding of learning preferences is a prerequisite for the efficient use of ICTs in education [25]. Therefore, the identified difference in learning preferences must be taken into account when developing educational materials. This statement is

illustrated by the example of teaching Ukrainian and Chinese students with different ratios of vis-to-vrb styles (Fig. 6b).

Students with a distinct visual learning style better remember for what they see - pictures, diagrams, flowcharts, graphs, movies and visual demonstrations. Verbal students are more likely to receive information in the form of words - written and oral explanations. The optimal pedagogical approach to the organisation of training, as well as the optimal teaching methods, should be different for students with different preferences. Only those e-resources, which are qualified for the use in teaching students with preferred visual and verbal learning styles, are shown in Table 2.

Table 2. Integration of methods and e-resources for visual/verbal dimension

	Visual	Verbal
Characte-ristics of student style	Well perceived and better-memorised images: drawings, diagrams, charts, graphs, etc.	Well perceived language and text elements, more information is obtained from words - written and oral explanations
A pedago-gical app-roach to the organi-sation of learning	Both types study better when the teaching material is presented both visually and verbally	
	Students better remember what they see	They quicker perceive spoken or audio in-formation. It is better to remember what they read or hear
Learning best-suited methods	Visual, practical Problem-searching Modelling Experiment Games and simulations Independent work with training programs and simulators	Verbal, visual Problem-searching Lecture, Exercises Method of questions and answers Discussion panel Brainstorm Individual work with text Work in the group can be particularly useful: students achieve an understanding of the material, hearing the explanations of the groupmates and learn even more when they explain the material
E-resour-ces qualifi-ed for use	Static and dynamic visualisations Quantum chemical simulation of spectra Modelling of experiments Virtual labs are best suited for learning Teaching programs Teaching database Tests ready for use	Static visualisation Quantum chemical simulation of spectra Lab complex with measuring sensors E-textbooks Chat, E-mail Teaching programs Search engines

Integrating aspects of styles, and selecting e-resources and teaching methods allow one to change the teaching methodology, focusing on the characteristics of students. The main stages of the developed approach are as follows:

– the development of a training and work program, and the establishment of objectives of the study of a discipline;

— investigation of the composition of a student group by Felder-Soloman's model;
— selection of teaching methods and essential electronic resources according.

The optimal methodology seeks to balance teaching and learning styles rather than to achieve absolute consistency between each lecturer's action and students' learning preferences. The discomfort should not be significant when students work according to a method that does not fit their learning styles. However, some discomfort is necessary for the formation of knowledge and qualifications of a future specialist. Entirely consistent with student's learning preferences, teaching methods do not create conditions for their progress.

The results show that the existing MEED system allows ones to operate effectively with e-resources and organise access of students to information regardless of the language of study. The fullness of e-resources in demand is a critical requirement in creating conditions for efficient English-language training.

5   Conclusions

A survey of 1,414 students of KNUTD showed the existing high demand for English-language education. 59% of all students surveyed or 66% of those who studied English in school expressed interest in English-language learning.

The demand for English-language teaching is supported by a reasonably high level of language proficiency. Of the 1,414 students, about 90% studied English at school. The survey showed that out of this amount, approximately 30% possess knowledge at level B or C, which is sufficient to accept training materials in English. About 59% show knowledge at level A, which requires some improvement but simultaneously can be considered as a basis for improvement which, if desired, can be amended quite quickly. Only 11% are feeble in English.

The motivation for English-language training is primarily connected with the opinion that such training will contribute to career growth. The second most important motivating factor is studying abroad or in graduate school.

The basis for organising English-language training should be considered the readiness of approximately 44% of students to participate in programs on a paid basis. This figure is lower among budgetary students and, depending on the faculty, is 1.3-4 times higher for students of contracted forms of education.

Among the proposed forms of training, the easiest one prevails over others, when training begins with teaching 1-2 disciplines in English. This form dominates in those faculties where students show a lower level of English. At the faculties, where the level of knowledge is high, there are no noticeable preferences among the forms of training. In essence, approximately the same percentage of students are ready for a complete transition to English, as well as for various forms of partial study.

The understanding of learning preferences is a prerequisite for the efficient use of ICTs in education. Therefore, the identified difference in learning preferences, illustrated by the example of teaching Ukrainian and Chinese students, must be taken into account when developing educational materials.

The readiness of the existing learning environment was tested by analysing the organisation of access to English-language teaching materials, assessing the demand for different electronic resources. The results show that the existing MEED system allows ones to operate effectively with e-resources and organise access of students to information regardless of the language of study. The fullness of e-resources in demand is a critical requirement in creating conditions for efficient English-language training.

References

1. Mandl, H., Reinmann-Rothmeier, G.: Environments for Learning. In: Smelser, N.J., Baltes, P.B. (eds.) International Encyclopedia of the Social & Behavioral Sciences, pp. 4697–4701. Pergamon Press, Oxford (2001). doi:10.1016/B0-08-043076-7/02368-8
2. Bottino, R.M.: The evolution of ICT-based learning environments: which perspectives for the school of the future? British Journal of Education Technology **35**(5), 553–567 (2004)
3. Maksymova, L.: Pedahohichni umovy funktsionuvannia informatsiino-navchal'noho seredobyshcha vyshchoho navchalnoho zakladu ekonomichnoho profiliu (Pedagogical conditions efficiency of information-learning environment for the university of economic profile). Continuing Professional Education: Theory and Practice 3–4, 69–74 (2013)
4. Bottino, R.M.: Advanced Learning Environments: Changed Views and Future Perspectives. In: Ortega, M., Bravo, J. (eds.) Computers and Education, pp. 11–27. Springer, Dordrecht (2001). doi:10.1007/0-306-47533-2_2
5. Li, L.: Scholarly information delivery in the information age. In: Li, L. (ed.), Scholarly Information Discovery in the Networked Academic Learning Environment, pp. 93–122. Chandos Publishing, Cambridge (2014). DOI:10.1533/9781780634449.2.93
6. Basha, A.D., Umar, I.N, Abbas, M.: Managing ICT Resources in E-learning Environment: Challenges, Issues and a Proposed Model. In: Proceedings of the 2011 3rd International Conference on Computational Intelligence, Communication Systems and Networks, pp. 319-322, IEEE Computer Society, Washington (2011). doi:10.1109/CICSyN.2011.73
7. Modlo, Ye.O., Semerikov, S.O., Nechypurenko, P.P., Bondarevskyi, S.L., Bondarevska, O.M., Tolmachev, S.T.: The use of mobile Internet devices in the formation of ICT component of bachelors in electromechanics competency in modeling of technical objects. CEUR Workshop Proceedings **2433**, 413–428 (2019)
8. Ekkert, M., Ostopolets, I. (eds.): Modern Technologies in the Education System. Wydawnictwo Wyższej Szkoły Technicznej w Katowicach, Katowice (2019)
9. Bolshanina, S.B., Dychenko, T.V., Chaichenko, N.N.: The use of mix platform for organising blended learning in teaching general chemistry to students of engineering specialties. Information Technologies and Learning Tools **75**(1), 138–142 (2020). doi:10.33407/itlt.v75i1.2577
10. Haddad, W.D., Jurich, S.: ICT for Education: Potential and Potency. In: Haddad, W., Drexler, A. (eds.) Technologies for Education: Potentials, Parameters, and Prospects, pp. 34–37. UNESCO, Paris (2002)
11. Kademiya, M.Yu.: Suchasni modeli osvity: perevahy ta nedoliky (Modern education model: advantages and disadvantages). Problems and Prospects of Formation of the National Humanitarian and Technical Elite 36–37(40–41), 23–30 (2013)
12. Morgulets, O.B.: Upravinnya vyshhym navchal`nym zakladom yak sub'yektom rynku (Management of a Higher Education Institution as a Market Participant). KNUTD, Kyiv (2017)

13. Poyasok, T.B., Bespartochna, O.I.: Arrangement of pedagogical interaction among the education process participants in computer-oriented educational environment of a higher education institution. Information Technologies and Learning Tools **67**(5), 199–212 (2018). doi:10.33407/itlt.v67i5.2110

14. Gryshchenko, I.M.: Factors enhancing the efficiency of educational activity of higher education institutions in Ukraine. Actual Problems of Economics 177(3), 134–141 (2016)

15. Petrenko, S.V.: Optimisation and analysis of the results of using LMS Moodle in the mixed learning system in university. Information Technologies and Learning Tools **61**(5), 140–150 (2017). doi:10.33407/itlt.v61i5.1795

16. Nechypurenko, P.P., Semerikov, S.O.: VlabEmbed – the New Plugin Moodle for the Chemistry Education. CEUR Workshop Proceedings **1844**, 319–326 (2017)

17. Zaporozhan, V.M., Kresyun, V.Y., Aryayev, M.L Chernetska, O.V.: Study in English as a stimulator of education quality and international contacts. Medical Education 2, 45–46 (2011)

18. Chornobai, K.G., Bondarenko, L.I.: Improvement of professional training of future specialists physical and technical specialities through the use of bilingual courses in physics. New Computer Technologies **16**, 211–214 (2018)

19. Phuong, Y.H., Nguyen, T.T.: Students' Perceptions Towards the Benefits and Drawbacks of EMI Classes. English Language Teaching **12**(5), 88–100 (2019). doi:10.5539/elt.v12n5p88

20. Cai, H., Wang, M., Yang, Y.: Teaching Accounting in English in Higher Education – Does the Language Matter? English Language Teaching **11**(3), 50–59 (2018). doi:10.5539/elt.v11n3p50

21. Suprun, D.M.: Vyshcha osvita v Ukraini: internatsionalizatsia, reform ta novovvedennia (Higher education in Ukraine: internationalisation, reforms and innovations). Scientific Journal of National Pedagogical Dragomanov University. Series 19 "Special Education and Psychology" 34, 171–178 (2017)

22. Lihe, H.: Development of Foreign Language Education in China under the Belt and Road Initiative. Journal of Language and Education **5**(4), 138–145 (2019)

23. Velikaya, E.: New approaches to teacher development in an EAP context. Journal of Language and Education **1**(1), 38–44 (2015). doi:10.17323/2411

24. Hrytsenko, V.H.: Efficiency criteria of the information-analytical control system creation and implementation in the university educational process. Information Technologies and Learning Tools **61**(5), 233–244 (2017). doi:10.33407/itlt.v61i5.1805

25. Derkach, T.M: Electronic resources in teaching basic chemical disciplines at universities. Science and Education **12**, 99–109 (2016). doi:10.24195/2414-4665-2016-12-19

26. Felder, R.M., Soloman, B.A.: Index of Learning Styles Questionnaire. https://www.webtools.ncsu.edu/learningstyles. Accessed 28 Feb 2020

27. Felder, R.M., Brent, R.: Teaching and Learning STEM: A Practical Guide. Jossey-Bass, San Francisco (2016)

28. Derkach, T.M., Kharitonenko, A.I.: Preferred learning styles of undergraduate and graduate pharmacy students. Research Journal of Pharmacy and Technology **11**(10), 4277–4284 (2018). doi:10.5958/0974-360X.2018.00784.9

29. El-Bishouty, M.M., Aldraiweesh, A., Alturki, U., Tortorella, R., Yang, J., Chang, T.W., Graf, S., Kinshuk: Use of Felder and Silverman learning style model for online course design. Educational Technology Research and Development **67**, 161–177 (2019)

30. Derkach, T.M.: Progress in Chemistry Studies for Students of Industrial Pharmacy Speciality with Different Learning Styles. Orbital: The Electronic Journal of Chemistry **11**(3), 219–227 (2019). doi:10.17807/orbital.v11i3.1395