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# Systemic Dynamics of Digital Education in Foreign Languages Programs

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## ABSTRACT

The global pandemic and subsequent quarantine measures and restrictions have posed an array of challenges to the structure and procedure of higher education workflow, which influenced significantly the scope of individual experiences, projected outcomes and estimated quality of higher education in countries across the world. This study focus is the in-depth assessment of the progress in individual digital and hybrid learning experiences by students of different tiers (Bachelor's level, Master's level, Graduate school level) in Oriental (Mandarin Chinese, Japanese) and European (French, Italian, Spanish, English) Languages university level programs at Borys Grinchenko Kyiv University of Ukraine through the span of educational activities in the time-frame of COVID-19 quarantine measures of March 2020 to November 2021. The comparative survey benchmarking and analysis of different e-learning dimensions is used to assess the progress and challenges of individual quality and efficiency of translation of the real life Foreign Languages Acquisition practices into digital and hybrid format, involving activation of interoperable skills and cross-sectorial activities, facilitated by digital tools. Two consecutive online surveys of over 500 students of Oriental and European Languages programs provide for disclosure of progressive dynamics of student satisfaction with digitalized foreign languages education, assessment of systematized individual experiences and changes in quality estimation of e-learning and hybrid learning in the framework of COVID-19 lockdown through the years 2020-2021; assessment of changes in individual experiences and quality of e-learning and hybrid learning in the framework of COVID-19 lockdown as compared to traditional, face-to-face learning formats for foreign languages; individual quality assessment of learning process design, dynamic development of programmed learning outcomes and projected competences for university programs of Oriental and European languages in the framework of 2020-2021 quarantine measures.

**Keywords:** Digital Learning; Hybrid Learning; Digital Literacy; Oriental Languages; European Languages; Progress; Quality Assessment; Survey Study

## 1. INTRODUCTION

Theoretical problems of holistic, multidimensional modeling of reality and its separate spheres (one of these on the transitory edge of the XX-XXI centuries is the sphere of development of digital

smart technologies) are directed by the deterministic interaction of objects, signs of their reception and interpretation (in the field of individual and collective consciousness), embodiment, consolidation and retransmission of the results of interaction of these systems of features.

The intellectualization of modern global culture determines a qualitatively new approach to understanding the processes of parallel development of human activities and cognitive (intellectual) experiences. That is the origin and methodological premise of the concept of "noosphere". The noosphere is defined as the current stage of development of the biosphere, associated with the emergence of humanity in it [5; 12], and is interpreted as part of the planet and planet ambient with traces of human activity. The integral real component of the Noosphere is identified as the Technosphere - a set of artificial objects (technologies) created by the humankind, and natural objects changed as a result of technological activity of humankind [4; 7]. In turn, Computer Being (computer reality, cyberspace) is a complex, multidimensional, interdisciplinary sphere of synthesis of reality, human experience and activity mediated by the latest digital and information technologies; technogenic reality, a component of the technosphere of existence.

The global pandemic of COVID-19 emerged as a kind of a black swan scenario or a singularity (event horizon) [24] for interdisciplinary domains of social and economic life, including education. The black swan theory is a concept that describes an event that comes as a surprise, has a major effect on society, and is often inappropriately rationalized after the fact with the benefit of hindsight [10].

In the educational domain, according to our estimations, the result of fundamental Technospheric shift, induced by the COVID-19 pandemic development and enhanced by subsequent digitalization measures, was the need to take quick comprehensive action [7] in order to achieve such desirable results: to adapt the existent educational scenarios to digital, remote and blended formats; to activate complex interdisciplinary skillsets, otherwise latent or underutilized in the educational process; to boost digital competence and digital literacy of all participants of the educational process relocated to computer being.

The global pandemic and subsequent quarantine measures and restrictions have posed an array of challenges to the structure and procedure of higher education workflow, which influenced significantly the scope of individual experiences, projected outcomes and estimated quality of higher education in countries across the world.

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Foreign Languages Acquisition on university level major programs is a rigorous process [6] that involves different stages and a regimen of activities and competences across interconnected interdisciplinary domains. The presented study is a parcel of comprehensive institutional inquiry [7; 8; 9] into the toll digitalization and amplified use of ICT tools put on different aspects of Oriental (Mandarin Chinese and Japanese) as well as European (Italian, Spanish, French, English) languages acquisition efficiency, assessment management, programmed results, communicative and digital competency formation in COVID-19 lockdown paradigm.

The estimations of digital distant education quality, conducted across various studies in the pre-COVID-19 inquiry framework have spanned, among others, assessment of satisfaction with distance learning experience [13; 14]; evaluation of learning outcomes [16; 21]; overall attitudes to distance learning [22]; challenges of online education [23].

These issues require a comprehensive revisit and constant verification of the toll the global pandemic took on individual learning experiences and subsequent dynamic shifts in quality estimations of linguistic education in universities due to the abrupt transition to exclusively digital distant, blended or hybrid learning formats.

This **study objective**, henceforth, is to estimate and compare the systemic, sustainable and dynamic changes and progress (or lack thereof) in assessment of individual digital and hybrid learning experiences and efficiency of best practices by students of Oriental (Mandarin Chinese, Japanese) and European (French, Italian, Spanish, English, German) Languages university level programs at Borys Grinchenko Kyiv University, Ukraine, through the span of educational activities in the time-frame of COVID-19 quarantine measures of the year 2020 and the year 2021. The benchmarking survey analysis of different digital educational practices and activities is used to evaluate and compare the parameters and challenges of individual quality and efficiency of translation of the real life Foreign Languages Acquisition practices into digital blended format, involving activation of interdisciplinary skills and cross-sectorial activities, assisted by ICT tools. These issues require a comprehensive revisit and constant verification of the toll the global pandemic took on individual learning experiences and subsequent dynamic shifts in quality estimations of linguistic education in universities due to the abrupt transition to exclusively digital distant, blended or hybrid learning formats.

The study premise is based on identification of various digital distant learning formats (u-learning, m-learning, hybrid learning) [17] and modes for university educational programs and projected digital literacy requirements [2; 3; 11].

Within the parameters of this study we estimate electronic learning (e-learning) as a form of ubiquitous learning (u-learning) that involves learning in an environment with full access to digital devices and services at any given moment [25]. COVID-19 quarantine measures, put in place country-wide in educational institutions Ukraine in the time spans of March-December 2020 and January-November 2021 have demanded the simultaneous employment and overlap of the following digital learning formats: e-learning 1.0 (direct synchronous digital instruction), e-learning 2.0 (asynchronous digital collaborative learning, also known as “networked collaborative learning”), blended learning (in-person teaching with asynchronous ICT assisted learning methods) [15], hybrid learning (synchronous instruction of in-presence and remote students via ICT tools) [19].

Therefore, the structure and modelling of two dimensions of digital education is suggested: 1) *endocentric* (CONTENT,

TOOLS, INTERACTION OUTPUTS); 2) *exocentric* (SKILLS, COMMUNICATION, MEDIA, OUTCOMES) – Fig. 1:

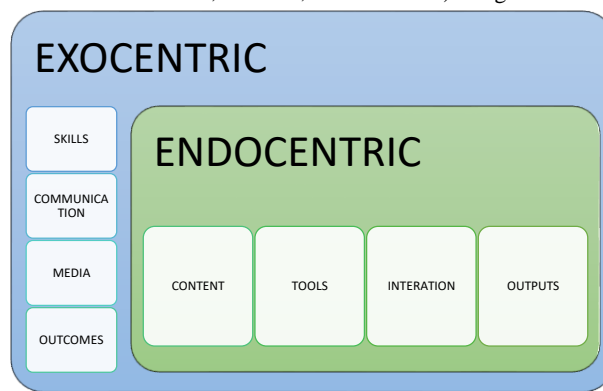


Figure 1: Digital Educations Dimensions Model and Structure

## 2. FINDINGS

### Method and sample overview

The study employs the combination of mixed methods [1] – a proportional arrangement of quantitative and qualitative inquiry to assess in-depth aspects of subjective and individual quality estimation of digital distant and hybrid learning. The comprehensive study design methodology included the following consecutive steps: 1) distant digital learning activity, experience and application profiling; 2) The online survey method - based on D. Dillman’s concept of mixed media and mixed mode surveys [18] - applied to conduct iterative, comparative in-depth assessment of individual digital distance and hybrid learning experiences and practices in the year 2020 and 2021 by students of Oriental and European Languages university level programs at Borys Grinchenko Kyiv University, Kyiv, Ukraine; 3) Digital distance and hybrid learning models and procedures adaptation and customization, tailored to the individual and group needs of stakeholders in Foreign Language Acquisition on university level. Based on the activity profile (digital distance and hybrid learning in Foreign Language Acquisition) an online survey was devised to assess in-depth subjective experiences of e-learning and hybrid learning in COVID-19 timespan for stakeholders of Oriental and European languages major programs.

The survey was launched *for the first time in January 2021* to evaluate the quality of emergency digitization experiences of students in 2020 (*the first academic year of the quarantine measures*). The survey was *then repeated in November 2021*, to evaluate the quality of ongoing digitization experiences of Foreign Languages students and to estimate positive or negative dynamics in e-learning quality assessment in 2021 (*the second academic year of the quarantine measures*).

The online questionnaire for both benchmarking iterations was identical and comprised of 21 questions total (multiple choice, scoring and short answer), divided into such categories: 1) Questions on overall assessment of individual experiences and quality estimation of e-learning and hybrid learning in the framework of COVID-19 lockdown and quarantine measures for university programs of Oriental and European and languages; 2) Questions on assessment of individual experiences and quality of e-learning and hybrid learning in the framework of COVID-19 lockdown as compared to traditional, face-to-face learning formats; 3) Questions on individual quality assessment of learning process design, programmed leaning outcomes and projected competences for university programs of Oriental and European languages in the framework of COVID-19 lockdown and quarantine measures.

A sizable sample of 532 respondents total across Oriental (Mandarin Chinese, Japanese) and European (English, French, Spanish, Italian) languages at Borys Grinchenko Kyiv University took part in the survey. The sample of 337 respondents covered the individual quality assessment of emergency digital learning of the year 2020. The sample of 195 respondents covered the benchmarking of progress in the quality assessment of digital learning of the year 2021.

**Systemic Dynamics of Digital Education: Survey Results**

Dimension 1 of survey analysis - overall assessment of individual experiences and quality estimation of e-learning and hybrid learning in the framework of COVID-19 lockdown and quarantine measures (March 2020 – December 2020, January 2021 – November 2021) for university programs of European and Oriental languages - yielded the following representative and comparative results across the board.

As a result of the year 2020 emergency digitization measures, students of European and Oriental languages programs of all levels at Borys Grinchenko Kyiv University evaluated their comprehensive individual experience of e-learning as predominantly 4 – mostly agreeable (35,3% of respondents), 3 – Average (30,9%), 5 – most agreeable – 20,8%.

As a result of the year 2021 digitization measures, students of European and Oriental languages programs of all levels at Borys Grinchenko Kyiv University evaluated their comprehensive individual experience of e-learning as predominantly 4 – mostly agreeable (39% of respondents), 5 – most agreeable – 37%, 3 – average (17%).

The average estimation of the overall individual satisfaction with e-learning and hybrid learning experience on Oriental and European Languages programs by students of Borys Grinchenko Kyiv University had qualitatively progressed from 4>3 – **mostly agreeable to average** in 2020 to 4>5 - **mostly agreeable to most agreeable** in 2021 (Figure 2):

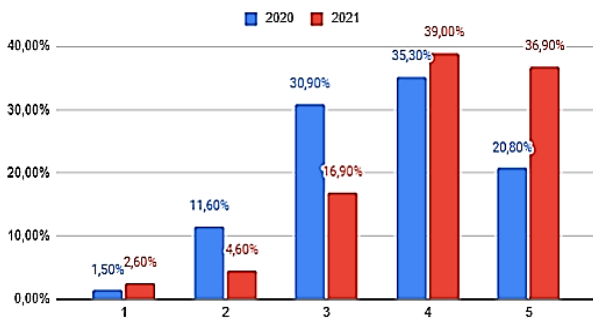


Figure 2: Comparative assessment of individual experience of e-learning and hybrid learning on Oriental and European Languages programs by students of Kyiv, Ukraine

Qualitative assessment of the e-learning and hybrid learning was conducted through the retrospective evaluation of respondents' individual experience through the span of the year 2020 and the year 2021, in order identify, select and compare the distribution of the preferred features and elements of e-learning and hybrid learning. Quantitative assessment demonstrated that in the years 2020 and 2021 students of European and Oriental languages programs of all levels in the surveyed university have distributed preferred features and elements of e-learning and hybrid learning and identified the significantly top ranking ones as follows (Figure 3):

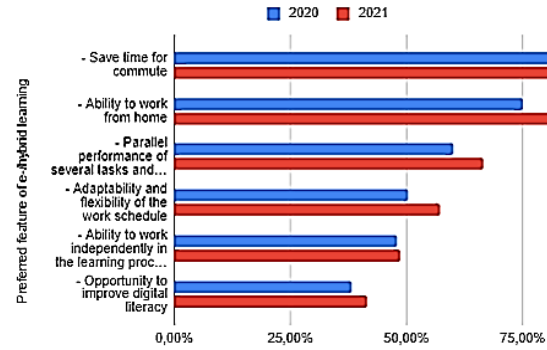


Figure 3: Comparison of top ranking of preferred features and elements of e-learning and hybrid learning: students of Oriental and European Languages programs (Kyiv)

It is notable that the consistently positively assessed (with a notable increase in the mean score) preferred features of e-learning and hybrid learning for Foreign Languages programs through the progress of digitization measures of 2020 and 2021 in the capital city university of Ukraine correspond to three dimensions: 1) time management due to the necessity to commute across a megapolis; 2) framework soft skills [11], identified as relevant for the job market of the 2020-2021 onward timespan – flexibility, adaptability, active learning, multi-tasking; 3) progressive positive increase in the assessment of digital literacy improvement [2; 3] as a by-product of qualitative and efficient digital and hybrid learning.

Evaluation of respondents' individual experience through the span of the year 2020 and the year 2021, allowed to identify, select and compare the features and elements of e-learning and hybrid learning, considered drawbacks, challenges or a hindrance.

Qualitatively, most prominent features and elements of e-learning and hybrid learning, considered drawbacks, challenges or a hindrance by all groups of students of Oriental and European languages programs of all levels at Borys Grinchenko Kyiv University in the year 2020 are: Emotional burnout (70,80%), Increasing the amount of workload in preparation for training sessions and ensuring the learning process (67,20%), Lack of interpersonal communication with students and colleagues on a regular basis (63%).

In the year 2021 the distribution of top scoring drawbacks, challenges or hindrances of e-learning and hybrid learning by all groups of students of Oriental and European languages programs is estimated as follows: Emotional burnout (45,80%), Increasing the amount of workload in preparation for training sessions and ensuring the learning process (44,70%), Lack of interpersonal communication with students and colleagues on a regular basis (55,90%).

As can be derived in comparison of the 2020 and 2021 benchmarking, the consistently top scoring features and elements of e-learning and hybrid learning, considered drawbacks, challenges or a hindrance by students of Oriental and European languages programs of all levels in the capital city university of Ukraine are qualitatively identical across both sampled timespans of digitization measures: Emotional burnout; Increased amount of workload in preparation for training sessions and ensuring the learning process; Lack of interpersonal communication with students and colleagues on a regular basis. However, there is an apparent reverse progress in the comparative estimation of drawbacks and challenges of e-learning and hybrid learning overall: emotional burnout as a

prominent challenge of digital learning format in the year 2021 (decrease by 25%), increasing the amount of workload in preparation for training sessions and ensuring the learning process (decrease by 22,5%), lack of interpersonal communication (decrease by 22,5%) in the year 2021 (decrease by 7,1%).

Respondents were iteratively asked to identify the e-learning and hybrid learning educational process elements that are conducive to quality of learning experiences outside of the COVID-19 framework and are preferable to be retained and implemented on a regular basis.

The following elements of hybrid and e-learning scored highest by students of European and Oriental languages programs at Borys Grinchenko Kyiv University scored highest as desirable to be retained and further implemented in the educational process outside of the COVID-19 limitation measures through the years 2020 and 2021 (Figure 4): Electronic tests and assessments online, Communication through electronic resources (mail, video, chat services, social networks), Use of e-textbooks and materials, Possibility of study / research work at home or without binding to a place (ubiquitous learning), Use of electronic learning management system (LMS Moodle, Google Class etc.).

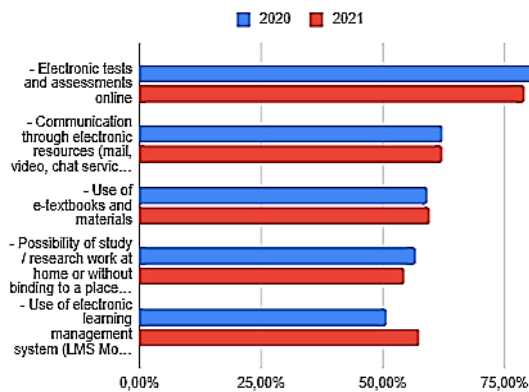


Figure 4: Elements of e-learning, most conducive to quality of learning experiences outside of the COVID-19 framework

As can be noted, through the time span of the second year of digitization measures in foreign languages program at Borys Grinchenko Kyiv University, there's a notable positive increase (by 7%) in assessment of electronic learning management systems as a staple of digital learning to be consistently retained outside of the quarantine framework. This development overall corresponds to the identified progress in assessment of the digital literacy improvement of students through the span of the second year of ongoing digitization measures.

Dimension 2 of survey questions - assessment of individual experiences and quality of e-learning and hybrid learning in the framework of COVID-19 lockdown as compared to traditional, face-to-face learning formats - yielded the following representative comparative results across the board.

Respondents of all groups were asked to compare the individual experiences and estimations of quality and efficiency of traditional, face-to-face in-presence learning and hybrid or e-learning in the sampled timeframes of the COVID-19 lockdown (respondents were instructed to disregard their individual assessment of blended learning or online learning prior to 2020). The comprehensive comparison of individual experiences of traditional learning (TL) and e-learning (EL) was ranked according to the 5-Point Likert Scale (5 – maximum quality and efficiency, 1 – minimum quality and efficiency).

Students have ranked the comparative quality of traditional and e-learning in the following way through the year 2020: 4 – mostly qualitative and efficient (TL – 46%, EL – 32,6% of respondents); 5 – most qualitative and efficient (TL – 33,82%, EL – 22,8% of respondents); 3 – average in quality and efficiency (TL – 12,5%, EL – 27,6% of respondents)

Through the year 2021 the comparative quality of traditional and e-learning was ranked the following way: 5 – most qualitative and efficient (TL – 36,92%, EL – 39,48% of respondents); 4 – mostly qualitative and efficient (TL – 27,69%, EL – 33,33% of respondents); 3 – average in quality and efficiency (TL – 18,46%, EL – 20% of respondents).

The average score of individual quality and efficiency comparison for traditional learning (TL) and e-learning (EL) by all groups of students in the capital city of Ukraine in the year 2020 is 4 – mostly qualitative and efficient. Whereas, through the year 2021 the comparative assessment of traditional learning and e-learning has consistently shifted the evaluation of EL in favor of the estimation “most qualitative and efficient” (top ranking 5). The comparative scores of EL across increments of the Likert scale have also undergone dynamic changes (the average estimation of e-learning quality and efficiency has decreased by 7,6%, the estimation of EL as mostly qualitative and efficient has increased by 4,1%).

There is a notable positive dynamics (increase by 10,2 %) in assessment of contrastive quality of e-learning as a 100% (full correspondence between EL and TL) through the year 2021.

Dimension 3 of survey questions - individual quality assessment of learning process design, programmed learning outcomes and projected competences for university programs of European and Oriental languages in the framework of COVID-19 lockdown and quarantine measures (2020 –2021) - yielded the following representative and comparative results across the board.

Respondents of all groups were prompted to assess the degree of adaptation efficiency of different elements of the educational design and process, identified as conducive to quality of e-learning and hybrid learning format in the framework of COVID-19. The scale of 5 (most efficiently adapted for e-learning and hybrid learning format) to 1 (least efficiently adapted for e-learning and hybrid learning format) was applied (Figure 5):

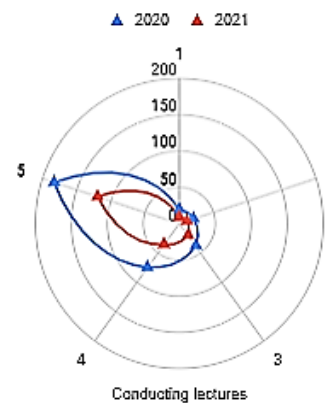


Figure 5: Adaptation efficiency ranking of educational process elements, conducive to quality of e-learning and hybrid learning format. Sample evaluation card (2020-2021)

Through the span of the years 2020 and 2021, students of Oriental and European languages programs of all levels have identified the adaptation of the following elements of the educational process and management as ranking proportionately efficiently and mostly efficiently adapted for e-learning and hybrid learning format) – Figure 6:

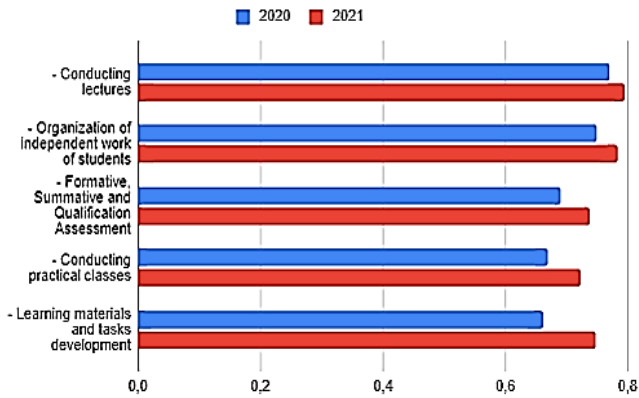


Figure 6: Comparative adaptation efficiency ranking of educational process elements, conducive to quality of e-learning and hybrid learning format (2020 – 2021)

There's a consistent observable increase (by an average of 5%) in the estimation of the adaptation efficiency of key educational design elements to digital and hybrid format through the year 2021 across Oriental and European Languages programs.

Respondents of all groups were prompted to identify the key challenges and impediments that impaired effective and qualitative adaptation of learning process design into hybrid and digital distant format.

Through the span of the initial digitization measures of 2020, students have identified the following top scoring challenges and limitations (technical and socio-psychological) in efficient and qualitative transformation of educational elements into hybrid and e-learning format in their individual experience: Fatigue (79,60%), Emotional burnout (69,60%), Technical difficulties (lack of stable Internet connection, lack of necessary equipment, capacity of household computer equipment) (69,30%), Stress (67,80%).

Through the span of the ongoing digitization measures of 2021, students have identified the following top scoring challenges and limitations (technical as quantitatively dominant, socio-psychological as overbearing in number of aspects) in efficient and qualitative transformation of educational elements into hybrid and e-learning format in their individual experience: Fatigue (56,70%), Emotional burnout (41,20%), Technical difficulties (lack of stable Internet connection, lack of necessary equipment, capacity of household computer equipment) (59,40%), Stress (38,00%).

Through the timespan of 2021 digitization measures technical challenges and limitations are estimated as scoring highest among other types of educational elements adaptation to digital format impediments (as compared to the year 2020 evaluation). However, there is an observable positive dynamic in the overall assessment of factors that prevent efficient and qualitative adaptation of Oriental and European languages programs adaptation to digital and hybrid formats through the span of 2021. This dynamic is exemplified by an average of 22,6% decrease in the overall evaluation of the socio-psychological factors that impede the digital adaptation of the educational design and procedures.

It is noteworthy that most of the challenges of the 'digital literacy' type feature as progressively insignificant (lower than 13% score through the year 2020 and lower than 9% score through the year 2021) in individual experiences of students of all levels at a university of the capital city of Ukraine. Such distribution of technical challenges estimation testifies to the phenomenon of *digital gap* [2], pervasive in various areas of educational activities in the framework of Covid-19 lockdown.

That placed students as an age group, as mostly representatives of the "digital native" generation - term by M. Prensky [26] - people born or grown up through early formative years into the digital society (1995 year of birth onwards), at a significant advantage in the hybrid and digital educational process through the implementation of emergency quarantine measures of in 2020 and 2021.

### 3. CONCLUSIONS

The survey results on the individual experiences and quality assessment of e-learning and hybrid learning in the framework of COVID-19 lockdown yield comprehensive data on the parameters and challenges of e-learning and hybrid learning transformation of Oriental and European languages programs, common for students of higher educational institutions of the capital city of Ukraine - Kyiv.

Overall individual experiences and quality estimation of e-learning and hybrid learning in the framework of initial and ongoing COVID-19 lockdown and quarantine measures (March 2020 – November 2021) for university programs of European and Oriental languages are assessed as progressing from average agreeable to most agreeable by all groups of students across educational levels.

The qualitative assessment of the e-learning and hybrid learning was conducted through the retrospective iterative evaluation of respondents' individual experience that helped identify the comparative coordinates of positive and negative dimensions of the latter. The invariant positive quality indicators for e-learning and hybrid learning across all groups of students, through both timespans surveyed are the opportunity for multitasking, digital skills improvement and lack of commute expenditure. The invariant negative quality indicators for e-learning and hybrid learning across all groups of students through both timespans surveyed are the lack of interpersonal communication, technical impediments and negative psychological states (fatigue, burnout, stress).

The contrastive exposure of individual experiences and quality of e-learning and hybrid learning in the framework of COVID-19 lockdown against the backdrop of traditional, in-presence learning formats identify e-learning and hybrid learning as increasing from mostly to fully comparative in quality for foreign languages stakeholders at Borys Grinchenko Kyiv University of Ukraine through the time period of 2020 to 2021.

Assessment of learning process design, programmed leaning outcomes and projected competences for university programs of Oriental (Mandarin Chinese, Japanese) and European (English, French, Spanish, Italian) languages in the framework of COVID-19 lockdown allowed to identify the types of challenges that impaired effective and qualitative adaptation of learning process design into hybrid and digital distant format as predominantly socio-psychological for students of all groups surveyed.

The overall positive dynamics of the assessment of estimated challenges of efficient digital educational adaptation is informed by the arrangement of factors: 1) consistently improved level of digitalization of the teaching resources and implementation of a functional e-learning environment in the form of a digital campus; 2) consistently improved and adapted level of digital literacy of students (implemented through flexible digital literacy training at the university for all stakeholders); 3) consistent professional psychological, communicative, technological and organized peer support to ensure the alleviation of challenges and impeding factors of foreign languages programs adaptation to digital and hybrid format. These elements of educational procedure and management at Borys Grinchenko Kyiv University can be scaled to serve as best practices and



recommendations to ensure sustainable quality of Oriental and European Languages programs transformation into digital, blended and hybrid format in capital city universities as well as regional universities of Eastern Europe.

The presented study is limited in scope to the indicative survey results, exemplifying the outlined quality assurance dimensions of e-learning and hybrid learning implementation for Oriental and European languages programs in regional universities of Ukraine, induced by emergency (2020) and ongoing (2021) COVID-19 digitization measures. The perspectives of the inquiry include fine-tuned estimation of the in-depth subjective quality assessment and subsequent efficiency assessment of hybrid and e-learning in different regions of Ukraine; contrastive case studies of Oriental and European languages programs emergency digital distance format adaptations in the COVID-19 timespan in universities of regional and national status; contrastive case studies and best practices of Oriental and European languages programs transformation to hybrid and e-learning format in countries of Asia and Europe upon alleviation of COVID-19 restrictive measures.

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