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## ECOLOGY OF E-LEARNING

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### ABSTRACT

**Purpose.** The paper deals with the role of new digital technologies in learning. The **tasks** for the research are the following: to bring readers with an up-to-date range of new learning and teaching technologies, explore the notion of "ecology of e-learning" by analyzing the dynamics of student and teacher interactions in e-learning environments, investigate critically the ways in which technologies can create openings for new pedagogical practices, and also at times fossilize old pedagogical practices that perhaps should have been already abandoned, explore the "affordances" framework as a checklist used to analyze educational technologies and their associated pedagogical practices.

**Methodology.** The methods of the educational research context, data collection, data analysis and reporting of the students' responses have been applied. Some interviews have been conducted in this study to receive the answers of different students and lecturers at Kharkiv University of Humanities 'People's Ukrainian Academy'. The basis for our research has been scientific and pedagogical studies relevant to future foreign languages teachers' professional training in distance education conditions.

**Results.** Didactic and reflexive pedagogy have been analyzed and compared. The following aspects have been analyzed: ubiquitous learning, active knowledge making, multimodal meaning, recursive feedback, collaborative intelligence, metacognition, differentiated learning. It is emphasized that digital ecologies and the new learning spaces afforded by technologies provide us with the availability to have a group of learners in a space where not all of them have to be tracking the same page, the same task at the same time. It is possible to create learning experiences for

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individuals and for groups with specific needs and to be able then to pace either the whole group or to pace the individual, to track an individual or to track the whole class depends on the learning process, either for the whole class or the individual, in order to adjust the instruction, the data, the information that the learner or the class has, so that they are able to meet their goals. It is highlighted that every child in the classroom even if they are the same age, or if they are the same background are unique in some way. The orientation to learning or their behavior, or their understanding of their purpose is molded by each one's life experience. Educators have a responsibility to show that every learner is transformed, progresses, is able to understand and engage with and represent knowledge in a way that meets their needs of being an educated person that can move through the formal school system.

**Conclusions.** Working within digital spaces allows us to harness the attention of every learner, to tailor educational process for their needs, to track whether they are performing or not and to adjust what we are doing. It provides us with the ability to make sure that all learners can be engaged. It means a different kind of plan. It certainly means collaborating. Collaborative intelligence for teachers in preparing, work and instruction in this space is also a key to the kinds of solutions that possible.

It means designing lessons with the learners in mind, not only with just pacing ones way through the standards or with any kind of curriculum, it is aligning the standards to individual's needs and deconstructing them and reconstructing them in order to pace individuals and groups so that they can progress towards higher or to goals. It means for the teacher expanding their instructional repertoires to be able to address all the learners in the classroom and as well as expanding the capacity to work with others to bring in experts through the digital ecologies that might be able to support individual learners.

**KEYWORDS:** Active Knowledge Making, Collaborative Intelligence, Differentiated Learning, Digital Ecologies, Distance Learning, Metacognition, Multimodal Meaning, Recursive Feedback, Ubiquitous Learning.

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## INTRODUCTION

One of the most oft-used terms after the pandemic is the term "new normal." The new normal in education is the increased use of online learning tools. The COVID-19 pandemic has triggered new ways of learning. All around the world, educational institutions are looking toward online learning platforms to continue with the process of educating students. The new normal now is a transformed concept of education with

online learning at the core of this transformation. Today, digital learning has emerged as a necessary resource for students and schools all over the world. For many educational institutes, this is an entirely new way of education that they have had to adopt. Online learning is now applicable not just to learn academics but it also extends to learning extracurricular activities for students as well. In recent months, the demand for online learning has risen significantly, and it will continue doing so in the future.

Analysis of the researches show the stated problem topicality in the scientific world. So, most of the scientists' attention is paid to applied aspects of distance learning: (Mamun, Lawrie, & Wright, 2020; Baran, & Correia, 2014; Friedman, 2017; Kennedy-Manzo, 2002; Mean, Toyama, Murphy, Bakia, & Jones, 2009; Picciano, & Seaman, 2009; Wildavsky, 2001; Willis, 1995).

A considerable number of scientific investigations is devoted to theoretical aspects of the approach under study (Moore, Dickson-Deane, & Galyen, 2011; Smith, 2014; Schwartzman, 2007; Bolliger, & Wasilik, 2009; Uvalić-Trumbić, & Daniel, 2013). Some researchers address to historical issue of the phenomenon (Haraism, 2006). There is a paper aimed at students' perceptions of the value and efficacy of an online learning community (Lapointe, & Reissette, 2008).

However, a comprehensive analysis of didactic and reflexive pedagogy based on online learning, needs to be conducted.

Thus, our **purposes** include:

- Bring readers with an up-to-date range of new technologies for learning and teaching.
- Explore the notion of “e-learning ecologies” by analyzing the dynamics of student and teacher interactions in e-learning environments.
- Investigate critically the ways in which technologies can create openings for new pedagogical practices, and also at times fossilize old pedagogical practices that perhaps should have been already abandoned.
- Explore the “affordances” framework as a checklist used to analyze educational technologies and their associated pedagogical practices.

## METHODOLOGY

The methods of the educational research context, data collection, data analysis and

reporting of the students' responses have been applied. Some interviews have been conducted in this study to receive the answers of different students and lecturers at Kharkiv University of Humanities 'People's Ukrainian Academy'. The basis for our research has been scientific and pedagogical studies relevant to future foreign languages teachers' professional training in online education conditions.

## RESULTS

We have analyzed and compared didactic pedagogy and reflexive pedagogy and came to some dimension statements, reflected in the current article, Table 1.

The first of these seven things is *ubiquitous learning*. By ubiquitous we mean: anywhere, anytime. We want to start off by contrasting that with traditional classroom setups or what we would call didactic pedagogy. The first thing about traditional classroom is that it has two forms of confinement going on, two forms of boundedness: in space and time. The space is created as a kind of communication space, communications architecture. One of the peculiar things about that space is that practically only one person can speak at a time if everybody is to hear that. It is called the classroom, it has four walls.

The second thing with time is called the timetable where we all have to be in the same space at the same time to hear the teacher, to have classroom discussions. There is a necessary simultaneity in that communication's architecture.

Now, definitely, even with traditional pedagogy, we tried to blur those boundaries a bit. It was called take home the textbook and do some homework. It was called distance education.

**Table 1**

*Dimension in Didactic Pedagogy and Reflexive Pedagogy*

<b>Dimension</b>	<b>Didactic Pedagogy</b>	<b>Reflexive Pedagogy (New Learning)</b>
<b>Spatio-Temporal Dimension</b>	Confined by the four walls of the classroom and cells of the timetable	<i>Ubiquitous Learning</i> : anywhere, anytime, anyhow
<b>Epistemic Dimension</b>	The learner as knowledge consumer, passive knowledge acquisition, memorization	<i>Active Knowledge Making</i> : the learner as knowledge producer and discerning knowledge discoverer/navigator
<b>Discursive Dimension</b>	Academic literacies: traditional textbooks, student assignments, and tests	<i>Multimodal Meaning</i> : new media texts, multimodal knowledge representations
<b>Evaluative Dimension</b>	Emphasis on summative assessments and retrospective judgments that serve managerial purposes but are not immediately actionable	<i>Recursive Feedback</i> : formative assessment, prospective and constructive feedback, learning analytics
<b>Social Dimension</b>	The isolated learner, with a focus on individual cognition and memory	<i>Collaborative Intelligence</i> : peer-to-peer learning, sourcing social memory, and using available knowledge tools
<b>Cognitive Dimension</b>	Focus on facts to be remembered, theories to be correctly applied	<i>Metacognition</i> : thinking about thinking, critical self-reflection on knowledge processes and disciplinary practices
<b>Comparative Dimension</b>	Homogenizing, one-size-fits-all curriculum, standardized teaching, and assessment	<i>Differentiated Learning</i> : flexible, self-expressive and adaptive learning, addressing each student according to their interests, self-identity, and needs

So, it is not as if the classroom completely confined us, but it was a kind of a focal point. The interesting thing about new technologies is a phenomenon that we call ubiquitous learning. It is actually a kind of a riff on the idea of ubiquitous computing. Some years ago the idea of ubiquitous computing was created, which means that we have devices with us everywhere and all around us which are computing devices. Today we have

funds, laptops, and a lot of intelligent household devices like televisions or fridges, or, whatever. Computing is all around us. The ubiquitous learning idea means that learning can be all around us.

We can have profound learning relationships which once really could only happen in a classroom, or could only be centered around the classroom. Those same learning relationships can happen with the same intensity without the

confinements of time and space that are in the traditional classroom.

Ubiquitous learning is certainly an idea that is now becoming itself ubiquitous, the idea that learning can happen anywhere at any time. The reason for it is that humans are learning creatures. When we use the notion of ubiquitous learning, we are really referring to what the new technology has made possible for us.

The degree to which it might be able to contribute continuously to the sorts of goals we have always had in education, which is the habit of mind of a learner. First of all, it is persistence, discerning. The search function of the Internet is really indicative of a kind of habit of mind that is required when you go into it, because you need to be continuously asking questions, searching for information, being flexible about how you move around in that space, open to the many things that are available and the many actors who are contributing to the space that we call the internet. It also requires a certain kind of independence as you weave your way through it. Certainly, it has made possible access to more people, experts, points, data points. That will enable information that you need to know or learn, whether it is formal learning, informal learning, or just out of interest.

Certainly, something very different is happening that we as educators need to figure out how we harness for the spaces that we work in, and for the goals that we have. One of the other features of this type of ubiquitous learning through the Internet and the digital spaces that are now available is the collapsing of time and space. That makes a huge difference for what we think about, and how we plan learning and teaching.

It also provides what we call life-long and life-wide learning. It is constant and explicit learning which is more interesting and important for us as educators, whatever you do in that space is discoverable. Every search engine you look at, every information you look up, every artifact that you create in this space can be tagged, can be searched, and can be used for multiple purposes. This is an extraordinary new environment which has enormous potentials for us.

If a student is doing their assignment at the moment and it is in a cloud environment, it is

on a server, they can be working on that assignment any time, any place, and other people can be interacting around it. They can be writing peer reviews, they can be writing comments, and any time the teacher can see what they're doing. That's a very big shift.

One of the interesting aspects of this shift to ubiquitous learning is something that we will call transparency. In cloud-based environments, it is possible to access everything the student is doing at any moment. It is possible to just click on an icon, and see the last keystroke that they typed, see the work that they are doing. It is also possible to build data analytics on top of this.

*Active knowledge making* is certainly a goal for all educators. We know and understand that producing knowledge is much more powerful than only consuming it. When you are in the cloud space, or working online, the tools and the framework itself require a much more active engagement with the areas that you are interested in. You are required not just to take something in, but there is the affordance of connecting and it is something that we all take up. It also allows in the space when we are working in, within the digital ecology space, that

anyone who is in that space can bring something to the learning experience. No one is left out, without interrupting or annoying anybody else.

This makes a powerful difference to learners in terms of their sense of agency. They can choose the engagement extent in much more significant ways than in an ordered classroom that requires very particular turn taking ways and participating when you put your hand up or when you are asked a question. It creates the possibility of contributing and building different kinds of answers and engaging with others around the strength and validity of those answers, and to produce what is genuinely useful for you in terms of the kind of interaction that you want to contribute.

Digital spaces will continue to offer opportunities for everybody acting and contributing at the same time. They will offer us opportunities for capturing all that activity whether it is speaking or writing, it allows us to track the artifacts of that production and to share that knowledge with more than the teacher. These are the possibilities that come from working within the space that has been afforded by the tools offered in the digital ecologies.

What we have got is a general move from hierarchical, top-down knowledge flows to more horizontal and more lateral knowledge flows. For instance, we have Wikipedia which is just endless. It is produced by people all over the world and we do not even know who the authors are. We do not know whether they are scientists or experts or whether they are just amateurs who have taken this thing very seriously. In a way, this is a big shift in the general framework of knowledge production in the world that we live. For us, this means that instead of the students becoming people who

absorb and memorize knowledge they become knowledge designers, knowledge co-creators.

The next point we want to make is a fundamental shift in what the focus of education is.

Traditional education is long term memory, but we are moving towards a world where memory is actually less important. The empirical details actually do not need to be remembered, because they can always be looked up again. It is your capacity to produce an artifact which is a good scientific report which is evidence of your learning, not what you can remember, which is a very big shift in focus and in what we are assessing.

One change is in workplaces, where traditionally the workplace was a place where there were bosses, and orders, and memos, instructions. But now, the idea is that we work in teams, we participate, contribute, and so on. That is a big shift in a concept that can be called the balance

of agency, which means that from a world of comp, command and compliance, we have a world where you are supposed to be more actively participating within the work team, contributing ideas, making suggestions, being creative, being innovative, taking risks. That is actually a different kind of person.

The old societies were ones of command and compliance. The society we are in now is of much more horizontal participation, active participation in these cultural spaces. For schools that means we should be really doing something which matches our time. If we do not, the kids will get behavioral problems. They will go crazy because their position is purely passive players. If we do not accept this change, we will end up in incredibly anachronistic institutions which our students hate.

The third of the advantages that we are looking at in this analysis is *a multimodal meaning*. One of the most powerful outcomes of digital ecologies is the actual capacity to manufacture different modes of meaning, with the same manufactory units. In fact, it is the digit themselves that is the most amazing accessible tool that learners can use, and it is the most revolutionary. Digital manufacturing allows us to produce alphabetical literacy. It allows us to produce any kind of sound, movement and images, just with clicking the same kinds of items, the same manufacturing units. Never before have learners had access to this potential. It is just an extraordinary capacity and we need to know the power of that capacity.

What does it mean to add a video to a piece of text as part of an assignment? What does it mean to bring audio in? We usually talk about speaking, and listening, and writing, and reading as separate domains, but the digital ecologies have now brought them together, in the way that they are manufactured and represented within the Internet and through the devices that all of us have. For us, it means a tremendous shift in how we understand these modes and how we help learners understand the power and the effect of each mode.

We are producing certain types of people, and the learners of the future, as the learners of today, **we** need to be able to engage with knowledge in a multimodal way. There is not now a worker in any field whether it is a mechanic, or a doctor, or a teacher, that does not need to engage with multiple modes of representation or meaning. So, for us to see these things as core to teaching and learning is really vital.

Now these knowledge representations are things that might involve various media. They might involve short typing

video, audio, but also data sets. So, what you might do is an Excel spreadsheet, and rather than just see the table that comes out of it, the teacher or the other students might like to see the underlying data, or re-manipulate it. We want an environment where dynamic modern information sources are really fully explodes for students and learners.

The word that we use theoretically to talk about this environment is multiliteracy. Multiliteracy is a broader sense of multimodal meaning, multimodal knowledge production. Firstly, we are getting the students to work in contemporary learning spaces. We are also deploying a cognitive mode which technically can be called synesthesia. The narrower, technical, psychological meaning of synesthesia is: I hear, I see a number, and I think of a color. This is a sort of a psychological condition where people with synesthetic have these associations that they make across concepts across modes.

For us this is a kind of a pedagogical rationales set for multimodality which involves fundamental cognitive processes. You learn through the process of switching from one mode to another. And the more our educational processes support that switching, the better. In the 21st century, we have marvelous media, which can support us in these very powerful forms of multimodal meaning, and cognitive shifts backwards and forwards between modes that we call synesthesia.

Anyone who has been a teacher or a learner understands the power of *feedback*. It matters in all that we do that we have some understanding of how we are progressing and how powerfully we are making meaning in the way that we intend to make it. The digital environment, the digital ecologies, digital

documentation, and the social access that the network gives for us now, makes feedback, which is so core to learning, so much more accessible to us. It is important that as we are producing knowledge, as we are working in any particular subject area, that feedback comes as we are producing that knowledge.

If we are allowed to simply produce it, at the end we get a test or somebody tells us whether we were right or wrong, we have missed an extraordinary opportunity in the process of the making of that knowledge. The internet and the digital ecologies that are available to us are capable of capturing our journey in reproducing or representing knowledge. And it is capable to provide feedback to learners step by step as they are producing that knowledge. And importantly, multiple sources of feedback are even better than one source of feedback.

So, when the teacher gives you feedback is good, but to get feedback from your peers, to get feedback from others, experts who can also join you in your journey of representing and producing knowledge in the class space provides a learner with much more confidence about their direction and a much richer learning experience that can feed into the kind of text and assignments that they are producing. Feedback enables us to document the way in which a learner has changed and grown and progressed. So, it is very important not only for that individual, but for the way that we might be able to generalize that understanding and help other students.

Timely feedback we know really matters. The digital ecologies however allow you to be able to set up systems which provide feedback as required, and it definitely leads to improved outcomes.

The other component to feedback is not only what you get, but what you give. We also know very clearly and it is very well documented that when you teach somebody else, your own learning gets elevated. So, providing learners with an opportunity to give peer to peer feedback helps everybody lift the level of performance and understanding. It is a very powerful tool that can be expanded in the digital environment.

Finally, in terms of why it matters, self-assessment is very important. It is important to get feedback, it is important to be tested, but in the end, every learner needs to be able to assess themselves to understand what they understand, and what they do not know.

The opportunities that the digital ecologies allow us, leads to very powerful learning outcomes and progress. The digital technology creates infinite amounts of capacity for interaction and immediate feedback, and that is something that we need to consider how to harness for the purposes of reaching our learners' goals.

Another area where I think technology environments could make a huge difference is an area that we want to call *recursive feedback*. What we mean by recursive feedback is loops. So, you get a bit of feedback and incrementally you do something with your work, and then you get a bit more feedback and incrementally you do something your work. And your work is continuously improving as a result of these feedback loops.

The form of assessment you are doing in this recursive feedback environment is actually quite different. You are thinking reflectively in a process of self-assessment. The teacher can still assess against the same rubric but what we

have built is this very dynamic environment where there are multiple forms of assessment going on which is a peer assessment, self-assessment, teacher assessment.

All these forms of assessment are going on in this space, and they are multiple perspectives. And what is interesting is that historically we only got the teacher's perspective and the teacher's perspective was only retrospective. Feedback relationships were hierarchical. What we are doing is, we are distributing that process, and building much more horizontal and reflective forms of evaluation or assessment, so it is a real shift in the kind of access of energy around this.

In recursive feedback environments we are accessing students actual work, artifacts. We have our students and they are producing their reports, and in essence remembering the facts or remembering the definitions, you can always look those things up, is less important than the business of building an artifact which is a scientific report or a physical geography report. So, that is a big shift in what we are actually assessing, in where we are actually assessing memory work less than we are assessing a whole pile of cognitive actions, which is being a scientist or being a geographer and producing a document like the kind of document that scientists and geographers characteristically produce. So, we are assessing an artifact which is the result of practice. There is a lot of cognition involved in that practice. But it is higher level cognition than just remembering stuff. It involves critical thinking, problem solving, applying concepts.

Another area where we believe there are enormous potentials in new technologies of learning is what we call *collaborative*

*intelligence*. In new media environments we can build highly collaborative processes of learning, where in fact it is not just your own work. It is actually deliberately producing work that others review, give you feedback on. The result of that is, by the time you have got feedback, perhaps from multiple perspective amongst your peers, and then you have done a revision. The quality of the revision is partly due to the quality of the feedback you have received, and the quality of other people's work is partly the result of the feedback you have given them. So, you are in a collaborative process of give and take around knowledge.

Without any doubt, we have mountains of evidence that testifies to the fact that learners working together, are able to solve problems, and are much more creative with any particular set of tasks than someone simply working on their own. It is not to say that people on their own are not creative and high performers. We know however that if you bring people with their very different orientations to the very same kind of problem, you are going to have a much richer learning experience, in a more condensed period of time. And this is a resource that matters to us in any learning environment.

And certainly, the digital ecologies that are available to us now one of the things that do so well, is the capacity for collaboration, the capacity for what we call social networking that people coming together and engaging with each other in powerful ways around their interests, or around particular tasks. The digital spaces provide us with the capacity for production and co-production, and they do allow us to have many versions which are captured and documented, which we can return to, which we can revise, we

can share amongst ourselves. In order to come up with some common knowledge in the end about any particular area, that is very powerful and as far and, and broad as it can possibly be given any particular task.

Collaborative work produces collaborative intelligence. Collaborative intelligence, very often as a consequence of the different inputs, produces higher standards and depth of knowledge from the process of the different perspectives and the different experiences coming together.

In the digital ecology environment, the audience is not one. In the classroom, in the traditional classroom with the individual working on, on their own tasks, the goal is that the teacher will be the recipient of the task, and the teacher will assess it. You are not producing knowledge for yourself, or for anybody else, you are producing it for very narrow purposes of the traditional, old-fashioned classroom, which required a discipline and order, for the particular kind of people.

The motivation there was limited to that test pleasing the teacher. Whereas in the digital ecology spaces, an intrinsic motivation, to make a contribution, to add to the knowledge, to create something that can be showcased, which is of a higher order, so the managing of behavior which is so vital in a traditional classroom that restricts the kinds of things that we can do is not a barrier in the digital space.

Cognition and action are, of course, core features of learning, whether you are involved in experiential learning, or conceptual learning, or analytical learning or, applying knowledge in any particular kind of way. But of equal importance is what we call *metacognition* in any learning environments. That is reflecting

about what you are doing, reflecting on the concepts that you are developing, on the way that you are applying any kind of particular knowledge. It is not just about knowing and understanding, but thinking about thinking.

Thinking about how you have gone about doing something, and thinking about the process that you were involved in, deliver a particular kind of outcome. So, metacognition is really important, and the digital spaces do allow, for creating spaces that allow learners to move in and out of producing whatever is required of them, as well as accessing rubrics and other kinds of tools as they go, to reflect, if they have met their goal.

Why does it matter that we do encourage learners to be reflective about their thinking, and reflective about their practices? We are preparing them for the real world. Knowledge in a classroom, learning in a classroom, should not be in a separate space that does not connect with what life is like, when you leave the classroom, or even as you live it in the classroom. Because in a classroom, you do not just work on subject areas, you actually live there, you have relationships, you engage.

So, we need to produce the kind of learner who understands how to operate with other people, how to be reflective about their practice. Whether it is in the work that they do in, in their future lives as workers the kind of work they are, they are going to need to do when they go to college, where research really matters. You have to validate and argue for what you are doing, not just simply represent it. Schools need to start preparing learners right from the very beginning, for that kind of behavior as a thinking, learning person and ensuring metacognition as part of the process of learning is really vital. Certainly, it matters because the 21st

century is fast moving, it is a complex world with much diversity. All people operating effectively within the 21st century need to be able to express their own mind.

*Differentiated learning* has become another one of those norms, that is vital in any kind of learning environment. The digital ecologies and the new learning spaces afforded by technologies provide us with the affordance, the opportunity to have a group of learners in a space where not all of them have to be tracking the same page, the same task at the same time. It is possible to create learning experiences for individuals and for groups with specific needs and to be able then to pace either the whole group or to pace the individual, to track an individual or to track the whole class to intervene within that learning process, either for the whole class or the individual, in order to adjust the instruction, to adjust the data, the information that the learner or the class has, in order that they're able to meet their goals.

Every child in the classroom even if they are the same age, or if they are the same background are unique in some way. The orientation to learning or their behavior, or their understanding of their purpose is molded by each one's life experience. Educators have a responsibility to show that every learner is transformed, every learner progresses, every learner is able to understand and engage with and represent knowledge in a way that meets the needs of them being an educated person that can move through the formal school system and go right through to college. It matters for us because the digital space allows if we interrogate it, for us to tailor learning experiences and instructions.

Learners do not any longer have to sit in the class room waiting while the teacher

attends to the needs of one child or waiting until the hand that they have in the air is answered. It is not necessary to waste the amount of time we do waste for learners. The data suggests to us at the moment that in any particular kind of learning environment, a student might have between 15 and 20 minutes of, exchanges with an educator. Working within digital spaces allows us to harness the attention of every learner, to tailor the learning to their needs, to track whether they are performing or not performing and to adjust what we are doing.

## DISCUSSION

Scientific investigation of manuscripts devoted to ecologies of online education has shown that most researchers agree with the fact that in spite of several disadvantages such as losing concentration, health issues, lack of socializing skills, isolation, being limited (not suitable medical science, engineering, other STEM subjects), lack of good internet connection, difficult prevention of cheating, advantages are still crucial: increased convenience and flexibility, building confidence in a student (Holubnycha et al, 2021), improved employee knowledge, ease of content update, interactive sessions, reduced costs, a huge variety of options, less intensity, the comfort of your home, easier attendance. It is proposed that online classes can be more developed in the future by making classes more interactive, making students more vigilant towards rules, asking students / teachers for feedback, making technology more accessible.

## CONCLUSION

For educators online learning means a different kind of plan. It certainly means collaborating. Collaborative intelligence for teachers in preparing, work and instruction in this space is also a key to

the kinds of solutions that possible. It means designing lessons with the learners in mind, not only with just pacing one's way through the standards or, or with any kind of curriculum, it is aligning the standards to individual's needs and deconstructing them and reconstructing them in order to pace individuals and groups so that they can progress towards

higher or to goals. It means for the teacher expanding their instructional repertoires to be able to address all the learners in the classroom and as well as expanding the capacity to work with others to bring in experts through the digital ecologies that might be able to support individual learners.

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### CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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**АНОТАЦІЯ / ABSTRACT** [in Ukrainian]:**ЕКОЛОГІЯ ЕЛЕКТРОННОГО НАВЧАННЯ**

**Мета.** У статті розглядається роль нових цифрових технологій у навчанні. Завдання дослідження полягають у наступному: ознайомити читачів із низкою нових технологій для навчання та викладання, вивчити поняття «екологія електронного навчання» шляхом аналізу динаміки взаємодії студента та викладача в електронному середовищі, критично дослідити шляхи, за допомогою яких технології можуть створювати можливості для нових педагогічних практик, а також ідентифікувати старі педагогічні практики, від яких, можливо, слід було б уже відмовитися, дослідити структуру можливостей як контрольний список, за допомогою якого можна аналізувати освітні технології та пов'язані з ними педагогічні практики.

**Методологія.** Застосовувалися методи освітнього дослідницького контексту, збору даних, аналізу даних та звітування відповідей студентів. У цьому дослідженні було проведено кілька інтерв'ю, щоб отримати відповіді різних студентів і викладачів Харківського гуманітарного університету «Народна Українська Академія». Основою нашого дослідження стали науково-педагогічні дослідження щодо професійної підготовки майбутніх учителів іноземних мов в умовах онлайн освіти.

**Результати.** Проаналізовано та порівняно дидактичну та рефлексивну педагогіку. Було проаналізовано наступні аспекти: повсюдне навчання,

активне створення знань, мультимодальне значення, рекурсивний зворотний зв'язок, спільний інтелект, метапізнання, диференційоване навчання. Підкреслюється, що цифрова екологія та нові навчальні простори, створені технологіями, дають нам можливість мати групу учнів у просторі, де не всі з них повинні стежити за однією сторінкою, тим самим завданням одночасно. Можна створити навчальний досвід для окремих осіб і для груп із особливими потребами, а потім мати можливість контролювати темп усієї групи або окремої людини, відстежувати окрему людину або відстежувати весь клас, щоб втрутитися в процес навчання, або для всього класу або окремої людини, щоб скорегувати інструкції, дані, інформацію, якою володіє учень або клас, щоб вони могли досягти своїх цілей. Підкреслюється, що кожна дитина в класі, навіть якщо вони одного віку або мають однакове походження, певним чином унікальні. Спрямованість на навчання або поведінка, або розуміння своєї мети формуються життєвим досвідом кожного. Педагоги несуть відповідальність показати, що кожен учень трансформується, прогресує, здатний розуміти, залучатися до та представляти знання у спосіб, який відповідає потребам його як освіченої людини, яка може рухатися через формальну шкільну систему.

**Висновки.** Робота в цифровому просторі дозволяє нам залучати увагу кожного учня, пристосовувати навчання до його потреб, відстежувати, чи успішний він чи ні, і коригувати те, що ми робимо. Це надає нам можливості для забезпечення залучення всіх учнів. Це означає інший тип плану. Це, звичайно, означає співпрацю. Спільний інтелект для вчителів у підготовці, роботі та навчанні в цьому просторі також є ключовим для можливих рішень. Це означає розробляти уроки з думкою про учнів, а не просто пробиратися за стандартами чи за будь-якою навчальною програмою, це узгоджувати стандарти з потребами окремої людини, деконструювати їх і реконструювати, щоб адаптувати темп для окремих осіб і груп таким чином, щоб вони можуть просуватися до вищих цілей. Це означає, що вчитель має розширити свій навчальний репертуар, щоб мати можливість звертатися до всіх учнів у класі, а також розширити можливості працювати з іншими, щоб залучити експертів через цифрову екологію, які могли б підтримати окремих учнів.

**КЛЮЧОВІ СЛОВА:** активне отримання знань, спільний інтелект, диференційоване навчання, цифрові екології, дистанційне навчання, метапізнання, мультимодальне значення, рекурсивний зворотний зв'язок, повсюдне навчання.

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