

# Students' Digital Learning Resources for Transversal Skills Improvement and Virtues Inculcation

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## ABSTRACT

The goal of the study is to analyse the relation between students' digital learning and transversal skills, as well as between students' digital learning and virtues. In the correlative study, 73 teachers of Class 12 of general education institutions participated, filling out a questionnaire in the Google Docs environment. As a result of the theoretical analysis, the criteria for digital learning have been identified - access to digital technologies, cooperation, teachers' digital competence and availability of activities in compliance with cognitive engagement levels. The findings of the correlation analysis show that the availability of activities in compliance with cognitive engagement levels is the most important in the development of transversal skills, while in the inculcation of virtues - cooperation. The access to digital technologies has a statistically significant correlation with both transversal skills and virtues. The teachers' digital competence promotes digital literacy and such virtues as responsibility and wisdom. The recommendations developed as part of the study include compilation and promotion of the positive experiences of digital learning at the state and local government level; continuous monitoring and feedback analysis of purposeful digital learning and educational quality at school and classroom level; the application of digital learning resources based on the offer of activities in compliance with the students' cognitive engagement levels at the personal level.

**Keywords:** Digital technologies, cooperation, digital competence, cognitive engagement.

## INTRODUCTION

The rapid increase in the share of information and communication technologies in the 21<sup>st</sup> century raises the issue of the defining and structuring the learning methods related to them (e-learning (electronic learning), m-learning (mobile learning), and d-learning (digital learning)). It has been concluded in a meta-analytic study that digital learning is a combination of electronic learning as web-based learning, computer-based learning, virtual classrooms and digital collaboration, and mobile learning as the application of mobile technologies through mobile operators in the communication process, which is not only digital (Basak et al., 2018), bringing it together in a format that complies with the modern digital environment and taking advantage of digital tools in an integrated way (Bersin, 2017) both face-to-face and remotely. Digital learning is any learning practice that applies technologies effectively in order to enhance students' learning experience and covers a wide range of tools, such as online classes, application of technologies in the classroom and at school; learning platforms; software etc. (VanderArk & Schneider, 2012), which became especially relevant during the COVID-19 pandemic (Seufert et al.2021).

Digital learning is characterized as, first, interactive, promoting the creative application of social media with modern teaching content and motivating methodical materials; second, student-centred, focusing on students' responsibility for their learning and its results with the teacher's support; third, situational, promoting authentic learning and internal motivation through the technology application; fourth, oriented

towards cooperation, organizing learning as an active social activity; fifth, corresponding to the students' demand, providing access to the content as a result of the application of various media; sixth, authentic, organizing active and meaningful activity based on real-life learning patterns (Witt & Baird, 2018).

In the context of digital learning, a systematic approach focused on the learner is urgent, which determines the learning outcomes as a function of the type of activities performed by the learners and is based on understanding of technology application in various types of learning activities, identifying 3 groups of activities - active, constructive and interactive, based on different levels of students' cognitive engagement and proposing a hypothesis that constructive activities

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in the learning process are more effective than active activities, while interactive activities are more effective than constructive activities (Chi, 2009; Beal & Cohen, 2012).

Such active activities as watching, fixing, underlining, highlighting, paraphrasing, choice, manipulation are engaging activities and they contribute to the attending processes by activating the existing knowledge and assimilate, encode, or store new information, which in the learning process manifests itself in highlighting the text or inserting important information into the box, in the application of manipulators, in the application of the virtual laboratory environment for the laboratory work performance. Such constructive activities as explaining or clarifying, justifying, connecting, concept map, planning and forecasting the results, proposing hypotheses are self-construction activities and contribute to creating processes by activating the integration of new information into the existing knowledge, structuring and restructuring the existing knowledge, correcting errors, analysing results, which in the learning process is manifested in taking notes, drawing concept maps, asking questions, advancing problems and hypotheses, comparing cases, developing projects, integrating text and diagrams in multimedia, visualizing analogies and alternatives, forecasting, constructing timelines. Such interactive activities as creating activities in a joint dialogue, discussions, argumentation, confrontation and overcoming challenges are guided-construction activities in an instructional dialogue and promote jointly creating processes by activating a constructive dialogue, which manifests itself in the learning process as conversations and discussions with peers, as well as physical interaction, e.g., by participating in modelling or computer simulations, etc. Chi, 2009; Beal & Cohen, 2012).

The goal of digital learning is to develop leadership in learning with such skills as problem solving, time management, independent project work and planning (Leek & Rojek, 2022). Application of digital technologies in digital learning motivates students to learn more and allows them to be productive. Students also like the application of the digital learning platform/gadgets because it is easier than reference books/notes (Pate, 2019; Alasa et al., 2022).

A team of volunteer teachers seeking to transform their practice to implement digital learning through professional collaboration in a school with a mature ubiquitous technology environment have identified the essential characteristics of digital learning as student-centred, collaboration-centred learning experience focused on key outcomes that could be accessed in any order and which students had the opportunity to choose how to obtain the evidence of their learning. All aspects of learning – access to resources and engagement in activities, collaboration and acquisition of learning evidence – have been achieved through digital technologies (Blundell et al., 2016). When starting the reform of the curriculum for the implementation of the competence approach in Latvia, in the regulatory acts at the national level, the achievable learning outcomes have been precisely defined in terms of transversal skills and virtues when finishing Class 12 (Regulations No 416 Regarding the State General Secondary Education Standard and Model General Secondary Education Programmes, 2019).

The goal of the study is to analyse the relation between students' digital learning and communication skills such as critical thinking and problem solving, creativity and

entrepreneurship, self-directed learning, cooperation, civic participation, digital literacy, as well as between the students digital learning and virtues such as responsibility, diligence, courage, honesty, wisdom, kindness, compassion, moderation, restraint, solidarity, justice, tolerance.

## METHOD

### Research Design

The correlative research design, in order to determine the relation between two or more variables (Martinsons et al., 2016), was chosen for the study, which was conducted in May - June 2022, to analyse the mutual relation between students' digital learning and transversal skills, as well as students' digital learning and virtues.

### Population and Sample/ Study Group/Participants

The initiated reform of the educational content, applying the competence approach, and the final outcomes set for its implementation, at the end of secondary school, determined the choice of the target group involved in the study – 73 Class 12 teachers from all regions of Latvia participated voluntarily in the study.

### Data Collection Tools

Respondents on a Likert scale (1=agree, 2=agree more than disagree, 3=disagree more than agree, 4=disagree) were offered to assess their students' digital learning resources in compliance with the criteria identified as a result of the theoretical analysis - access to digital technologies, cooperation, teachers' digital competence and availability of activities in compliance with cognitive engagement levels -, as well as the students' transversal skills and virtues. The survey was anonymous, and the obtained data were analysed in a summary manner.

### Data Collection

The data was obtained in cooperation with educational institutions and professionals in the field - by sending the questionnaire in the Google Docs environment by e-mail and posting it on social networks with a request to fill it out.

### Data Analysis

The processing of the quantitative data obtained in the study was carried out in the SPSS environment of the programme for the quantitative data processing. *Cronbach's alpha* coefficient to check the reliability of the test ( $\alpha=0.87$ ) was calculated for the secondary data acquisition of the primary data processing of the study, which indicates good internal consistency. Assessing the validity of the test, it can be concluded that the internal validity of the test is high, because all the important aspects characterizing the phenomena to be studied are included in the measurement and data processing was carried out during the analysis process, applying accurate statistical analysis methods, which allows us to achieve the goal of the study. In the data processing process, their compliance with the normal distribution was checked according to the Kolmogorov-

Smirnov criterion. The results of the Kolmogorov-Smirnov test to determine the empirical distribution show that the empirical data do not correspond to the normal distribution ( $p > 0.05$ ), which determined the application of non-parametric methods, and Spearman's correlation coefficient in compliance with the research set of instruments was used to determine the relations/connections in order to answer the research question: whether and what relation exists there between students' digital learning and transversal skills (critical thinking and problem solving, creativity and entrepreneurship, self-directed learning, cooperation, civic participation, digital literacy) and between students' digital learning and virtues (responsibility, diligence, courage, honesty, wisdom, kindness, compassion, moderation, restraint, solidarity, justice, tolerance).

## FINDINGS

The findings of the correlation analysis show that there is a statistically significant correlation between

- access to digital technologies as a digital learning resource and such students' transversal skills as critical thinking and problem solving ( $r = .64, p < .001$ ), self-directed learning ( $r = .60, p < .001$ ), civic participation ( $r = .51, p < .001$ ), as well as digital literacy ( $r = .78, p < .001$ );
- collaboration as a digital learning resource and students' transversal skills such as creativity and entrepreneurship ( $r = .63, p < .001$ ), as well as collaboration ( $r = .61, p < .001$ ).
- the teachers' digital competence as a digital learning resource and students' digital literacy ( $r = .75, p < .001$ );

- the availability of teachers' activities in compliance with the students' cognitive engagement levels and all the students' transversal skills defined in the educational policy documents (see Table 1).

Critical thinking and problem solving in themselves do not depend only on the access to digital technologies, but they are an essential resource for students to acquire diverse information. One and the same piece of information obtained can be used and interpreted depending on the levels of cognitive engagement, which in its turn encourages critically thinking students to choose appropriate digital resources and reliable sources of information. Media literacy is based on students' ability to filter selectively and obtain objective information. Access to digital technologies with the teacher's targeted support develops students' ability to formulate questions, analyse the context, evaluate critically (Pentang, 2021), as well as synthesize and interpret information; in complex situations, use the inductive and deductive approach, notice and eliminate logical reasoning errors in their own and others' statements, substantiate; formulate a complex problem, offer several solutions for it, choose the best one to implement, react flexibly to unexpected changes.

These results correspond to the results of other correlative studies, where it is concluded that transversal skills play an essential role in the conduct of an effective and targeted educational process in the online environment (Dochevska, 2020).

**Table 1:** Students' Digital Learning Resources for Students' Transversal Skills Improvement

Criteria	Access to digital technologies	Cooperation	Teachers' Digital competence	Availability of activities in compliance with cognitive engagement levels
Critical thinking and problem solving	$r = .64, p \leq .001$	$r = .33, p > .05$	$r = .40, p > .05$	$r = .55, p \leq .001$
Creativity and entrepreneurship	$r = .48, p > .05$	$r = .63, p \leq .001$	$r = .39, p > .05$	$r = .50, p \leq .001$
Self-directed learning	$r = .60, p \leq .001$	$r = .39, p > .05$	$r = .46, p > .05$	$r = .69, p \leq .001$
Cooperation	$r = .45, p > .05$	$r = .61, p \leq .001$	$r = .48, p > .05$	$r = .72, p \leq .001$
Civic participation	$r = .51, p \leq .001$	$r = .29, p > .05$	$r = .30, p > .05$	$r = .49, p \leq .001$
Digital literacy	$r = .78, p \leq .001$	$r = .35, p > .05$	$r = .75, p \leq .001$	$r = .75, p \leq .001$

Self-directed learning is largely related to the self-definition of the goals to be achieved, the effective use of the appropriate means for the goal achievement and the knowledge acquisition support system of the student's own intellectual potential. The involvement of the teacher - mentor, their methodical support, digital technology management, which is not aimed at the knowledge transfer and its multiplication, but at the self-education process promotion, cultivation of discussion culture, which is based on argumentation skills, should be considered as essential. The access to digital technologies develops such students' self-directed learning skills as setting short-term and long-term goals, planning of steps for goal implementation, taking responsibility; analysis and reflection on the connection of their activity with emotions,

personal characteristics and behaviour; selection, adaptation and creation of their thinking strategy in complex situations; management of emotions in a socially acceptable way and focusing on opportunities, benefits and positive solutions; evaluate, summarize and apply purposefully the evaluation, compilation and implementation of the acquired experience in the further work process. Self-directed learning does not only take place in the formal education system, but self-directed learning skills are also acquired in the informal environment, which has a significant potential to be used in a purposefully directed educational process.

Civic participation is an integral component of democratic culture, which is clearly manifested in the quality assurance of educational institutions' functioning. Positive growth of the

educational institution and personality depends on the management of democratic processes, where the students' self-governance plays an essential role, as it is involved in the development of the learning process quality, organization of public activities, which are often aimed at the quality of life improvement in communities outside the educational institution, as evidenced by the implementation of students' scientific research projects in cooperation with non-governmental organizations, interest clubs, municipal organizations, professional associations, which ultimately contribute to the purposeful selection of a professional and/or academic education path in the further educational process. In the conditions of the global pandemic, the skilful application of digital tools was able to ensure the process of civil participation, creating new discussion channels, promotion of the people involved and institutions responsible for the environmental quality, a healthy lifestyle, formation of community policies, etc. Access to digital technologies develops such manifestations of students' civic participation as explanation and justification of their view of interconnection, assessment of the individuals, society and environment interaction; selection of activities and daily situations in which to get involved and involve others, justification of their position, not succumbing to group pressure; responsibility for the consequences of their actions; acquisition of new experience independently and through cooperation, engagement in the search and implementation of solutions that help improve the quality of life.

The component of the cooperation transversal skills is necessary because the accumulation of all knowledge and skills in one person is not characteristic of the 21<sup>st</sup> century, it is even impossible, thus it is important to know how to find and unlock the intellectual and skill set of the people involved in the educational process in order to achieve the common goal. Creativity and entrepreneurship at the individual level depends on both personal initiative and cooperation, so that the potential of knowledge and skills of the students involved would create a synergistic effect. This means that summary knowledge has not been obtained, but the selection of activities to be performed for working in a team ensures the maximum possible effect. On the other hand, cooperation at all levels as a digital learning resource promotes such manifestations of students' creativity and entrepreneurship as interest in discoveries and innovations, proactive search and implementation of new opportunities, improvement of the quality of their own life and that of others, acceptance of challenges while maintaining the emotional balance and openness; application or search for the strategies to create their own ideas in order to arrive at solutions, application of resources to implement their ideas; application of mistakes and difficulties as opportunities for growth.

Digital technologies permeate almost all of the transversal skills required today, also including such areas that during the existence of the previous education paradigm, when the opinion of the effectiveness of the direct contact, which is of essential importance in the process of communication and emotional education, prevailed. However, in the conditions of the COVID-19 pandemic, it was made sure that both teachers and people involved in the educational process who have appropriate digital skills were able to ensure appropriate

quality of education, improve the culture of behaviour in the digital environment, acquire new forms of civic engagement that depend on the learners' interests and cognitive levels. In practice, it has been noticed that teachers often use convenient technologies and digital platforms, which partly depend on the specifics of the subject, but students are forced to acquire different digital tools from different teachers, as a result often surpassing the educators' skills who operate with uniform resources. The teachers' digital literacy as a resource for digital learning contributes to the manifestations of digital literacy such as purposeful selection and effective application of appropriate digital technologies; analysis of the benefits and risks of digital communication, responsible behaviour and communication in the digital environment according to their own and others' interests; critical analysis of the reality created by the media and the reliability of information, taking responsibility and taking action in order to prevent the impact of low-quality media content, respecting the privacy, ethical and legal conditions when creating one's own media content; analysis of the technology role, observation of healthy and safe technology application habits and their adaptation to one's needs, reflection on their digital identity and its compliance with their own and society's interests.

The availability of activities in compliance with the levels of cognitive engagement is an essential digital learning resource in the improvement of all students' transversal skills. Even though children have already acquired the first skills to apply various technologies at an early age even before they have mastered verbal communication: at the age of 2, children have mastered the device management skills, distinguishing the applications of interest; as the vocabulary develops, words and expressions of other foreign languages appear in the language, which are not used in the family, the dynamics of the growth of digital skills depends not only on age stages, but on lots of other factors: the desire to communicate with peers, to solve important problems related to the cognitive process, to get involved in interest groups, to realize themselves in the field of art, applying modern visual and audio technologies, to use digital tools in commercial practice, which is based on the acquired social experience, often in the accumulated digital resource environment. Developed students' transversal skills as the end result of secondary education is determined not by the application of technologies as an end in itself, but by the availability of a balanced, individualized and differentiated active or engaging activities, constructive or self-construction activities and interactive or guided-construction activities in instructional dialogue, considering the individualization and differentiation in compliance with various levels of students' cognitive engagement in the promotion of attending, creating and jointly creating processes.

The findings of the correlation analysis show that there is a statistically significant correlation between

- the access to digital technologies as a digital learning resource and such students' virtues as responsibility ( $r = .70, p \leq .001$ ), diligence ( $r = .50, p \leq .001$ ), courage ( $r = .51, p \leq .001$ ), wisdom ( $r = .73, p \leq .001$ ), moderation ( $r = .52, p \leq .001$ ), solidarity ( $r = .49, p \leq .001$ ) and tolerance ( $r = .53, p \leq .001$ );
- cooperation as a digital learning resource and students' virtues such as responsibility ( $r = .71, p \leq .001$ ), diligence

- ( $r = .50, p \leq .001$ ), courage ( $r = .76, p \leq .001$ ), honesty ( $r = .68, p \leq .001$ ), wisdom ( $r = .75, p \leq .001$ ), kindness ( $r = .64, p \leq .001$ ), compassion ( $r = .49, p \leq .001$ ), restraint ( $r = .69, p \leq .001$ ), solidarity ( $r = .79, p \leq .001$ ) and tolerance ( $r = .81, p \leq .001$ );
- teachers' digital competence as a digital learning resource and students' virtues such as responsibility ( $r = .65, p \leq .001$ ) and wisdom ( $r = .65, p \leq .001$ );
- the availability of activities in compliance with the levels of cognitive engagement as a digital learning resource and such students' virtues as justice ( $r = .55, p \leq .001$ ) (see Table 2).

**Table 2:** Students' Digital Learning Resources for Students' Virtues Inculcation

Criteria	Access to digital technologies	Cooperation	Teachers' Digital competence	Availability of activities in compliance with cognitive engagement levels
Responsibility	$r = .70, p \leq .001$	$r = .71, p \leq .001$	$r = .65, p \leq .001$	$r = .42, p > .05$
Diligence	$r = .50, p \leq .001$	$r = .54, p \leq .001$	$r = .41, p > .05$	$r = .39, p > .05$
Courage	$r = .51, p \leq .001$	$r = .76, p \leq .001$	$r = .39, p > .05$	$r = .40, p > .05$
Honesty	$r = .47, p > .05$	$r = .68, p \leq .001$	$r = .44, p > .05$	$r = .40, p > .05$
Wisdom	$r = .73, p \leq .001$	$r = .75, p \leq .001$	$r = .80, p \leq .001$	$r = .41, p > .05$
Kindness	$r = .33, p > .05$	$r = .64, p \leq .001$	$r = .33, p > .05$	$r = .45, p > .05$
Compassion	$r = .41, p > .05$	$r = .49, p \leq .001$	$r = .38, p > .05$	$r = .33, p > .05$
Moderation	$r = .52, p \leq .001$	$r = .40, p > .05$	$r = .40, p > .05$	$r = .43, p > .05$
Restraint	$r = .42, p > .05$	$r = .69, p \leq .001$	$r = .45, p > .05$	$r = .44, p > .05$
Solidarity	$r = .49, p \leq .001$	$r = .79, p \leq .001$	$r = .47, p > .05$	$r = .47, p > .05$
Justice	$r = .45, p > .05$	$r = .41, p > .05$	$r = .42, p > .05$	$r = .55, p \leq .001$
Tolerance	$r = .53, p \leq .001$	$r = .81, p \leq .001$	$r = .47, p > .05$	$r = .47, p > .05$

The obtained results do not contradict the results of other studies on the relation of digital learning resources to life values both in civic education (Komalasari et al., 2021) and in the context of inclusion and competitiveness in the labour market (Camilleri, 2015).

The access to digital technologies is related to responsibility. Responsibility as a moral category can be viewed in relation to ethical standards and norms institutionalized in the society. The access to the digital environment is a responsible opportunity and responsibility for both teachers and students. The digital environment, seemingly anonymous, often creates a temptation to apply it in a destructive way. When in the students' environment the social networks and information exchange channels are used to humiliate someone and spread false information, digital literacy without a responsible attitude or, at the very least, spreading uncritical information, frequently opens the way for plagiarism and other violations. Cooperating with IT specialists, teachers, parents, copyright experts, a greater awareness of the types of violations can be achieved, and everyone should be responsible for the consequences of their actions, excluding the excuse of ignorance.

Diligence is related to the effort of the will, it correlates with the access to the digital environment, to apply it purposefully, without getting carried away by aimless entertainment. Diligent students pretty often succeed ahead of their peers, who initially find everything easier.

Wisdom in a moral aspect is incompatible with the ability to succeed in a manipulative way. The wisdom of life, is possessed by people who live and act according to moral norms, which is called intelligence. As a result of cooperation, the wisdom of life is acquired in social institutions: the family, formal and informal educational institutions, communities of

interest and organizations bound by self-defined ethical codes. The access to digital resources and digital competence strengthen the ability to acquire knowledge and apply it wisely and purposefully for noble purposes.

Also in the digital environment, kindness to others is a way to promote cooperation, which correlates with the etiquette of the digital environment application. Genuine kindness without any pretence, adulation and flattery fosters trust. Expressers of unacceptable views can also be disarmed with kindness, which is often ensured by successful communication, for example the diplomatic protocol, but students acquire their first skills through mutual interaction in the well-known debate tournaments of the Latvian education system.

Compassion is formed as a result of personal experience, it is often traumatic, which can be overcome by getting engaged in the cooperation of social educators. The availability of the digital environment, where the positive examples evoking empathy can be encountered, worthy of imitation, promotes compassion, for instance, by providing support to socially vulnerable groups of people, also by getting engaged in the nature and animal protection movement, respecting the normative regulation of bioethics.

In the digital environment, moderation is a virtue, so as not to create a life in a parallel world that contrasts with the real one. Moderation focuses on the rational application of resources in order to ensure sustainability. However, human nature as a cultural subject has a characteristic tendency to satisfy not only their basic needs, but also the desire to beautify the environment, to be recognized and respected, which can be achieved for instance, following fashion trends, competing in the purchase of the latest IT technology equipment, which has the function of accessory and status, but not the need to use it to the full extent for self-improvement.

Restraint, which is related to psycho-emotional behaviour, depends both on the temperament and can be considered as an influenceable regulation of behaviour with the help of will and training, cooperating and respecting the interests of others, acquiring the culture of communication. Nevertheless, the digital environment can affect it negatively if an addiction develops that leads to uncontrolled behaviour due to over-indulgence and has a destructive effect on restraint.

Solidarity is most often manifested in belonging to a social group, providing support, cooperating in order to achieve common goals or to maintain a certain status. It is important to promote expressions of solidarity that are humane in nature. The kind of solidarity that can be observed in marginal groups with deviant behaviour, in which the possibility of democratic dialogue is excluded, but an authoritarian will is imposed, is reprehensible. In contrast to the solidarity of deviant groups, an alternative choice is offered, where the oppressed and humiliated regain their self-confidence and integrate into a humanely oriented environment, receiving support, without getting offended and allowing them to gain recognition from solidarity with personalities and social groups that respect universal human values. The access to digital technologies and solidarity with social groups that share common interests correlate mutually.

The sense of justice is an essential expression of noble feelings. Trials are caused by various manifestations of injustice in the process of distribution of benefits, including fair assessment of students' performance, which is not affected by status, physical gifts, appearance, etc. factors. At school, the problem of justice mainly arises in situations of conflict among peers, as well as in the conformity/non-conformity of self-assessment with the teacher's evaluation in the assessment of knowledge and in the assessment of attitudes in conflict situations. The released information in the digital environment allows us to compare and make conclusions about fair or unfair attitude, for instance in contests, competitions, rating creation, etc.

Tolerance is not innate, but the ability to respect the opinion of others, to acknowledge the uniqueness of other cultures, is inculcated and cultivated in the social environment. It is understandable that every person in an immediate way cannot get to know the peculiarities of the culture of all nations in an empirical way. However, the open digital environment is a rich resource to find out about the peculiarities of other people's culture, traditions, and customs in an indirect way, which offers opportunities for tolerance. It is not enough to know, but it is important to respect and honour the different.

Cooperation is a responsibility to work in a team, taking on different roles. In the role crystallization process, the generation of ideas, their analysis and synthesis process, and the implementation of ideas in proactive actions aimed at the defined goal achievement are important.

Diligence is necessary in cooperation so as not to stop at the first difficulties in the work process. Digital resources offer alternative solutions offered by digital resources if it is not possible to achieve the desired result with diligence.

Cooperation is fostered by the courage to get involved in solving unknown problems. The individual courage is to reveal one's weaknesses, which can be compensated by the partners' competence, courage is required to express an opinion that

contrasts with the opinion of the team, but the opinion must be reasoned. The digital informational environment for cooperation is successful in cases where people are introverts, born to work at their own pace and at their own preferred time.

Honesty in cooperation is associated with courage and tolerance, courtesy. However, remote communication can be used for dishonest purposes, identifying with another person, giving in to the temptation of plagiarism.

Wisdom manifests itself not only in the totality of knowledge, but also in the ability to apply knowledge and digital resources for the common good.

Kindness in all life situations is an integral part of intelligence, even in cases where unpopular decisions must be made without violating the dignity of others, for instance, in the digital environment in business correspondence, in critical reviews, etc.

Compassion is necessary in crisis situations, which is associated with empathy and the ability to motivate positively in order to overcome the crisis. For instance, support groups established in the digital environment, that have been created to overcome addictions, to overcome psychological problems.

Restraint is an essential character trait. It helps to find a solution in case of disagreement, without humiliating those who think differently or solving dilemmas of an ethical nature. Restraint and lack of restraint are often expressed in anonymous comments, but in cooperation the need for restraint dominates as a condition for a positive result achievement.

Solidarity in cooperation manifests itself in cases of individual and joint responsibility, mutual help and psychological support.

Tolerance is especially relevant if cooperation partners as a social group are not formed on the basis of mutual liking. It is important to look for points of tangency in common values without focusing on differences.

The teacher's competence is not limited to the knowledge of their field of study. The methodological readiness and the ability to provide the level of education corresponding to the stage of education, which is determined by the standards of the education system, are equally important. The special responsibility of a teacher is also related to the pedagogical competence, respecting the individual abilities and psycho-emotional characteristics of each student, for which each educator is responsible.

In the students' assessment, an intelligent teacher is the one who, in connection with the digital competence, knows their field of study perfectly, is able to excite and interest students, inspire with their example, and has qualities that unleash the students' individual abilities in mutual communication.

The sense of justice in some cases is relative, which depends on everyone's individual development and value system. However, the students' perception of justice will be adequate if the performance assessment criteria, terms of behaviour and ethical standards are clearly defined, by offering and organizing activities for students in compliance with the levels of cognitive engagement.

The findings obtained from data analyses should be presented in line with the aims of the study. Tables and figures can be used to display the results of the analyses. Findings section should deal only with presenting the results and should

not include the discussion of the findings. Sub-headings in line with sub-goals of the study can be used. Sub-headings should be flush left, in italics and with each word capitalized.

## DISCUSSION

The education reform in Latvia touches on an important aspect of education, which emphasizes the transformation of the educational values of the 21<sup>st</sup> century - the transition from the transfer of knowledge to the acquisition of knowledge in the context of self-directed learning skills improvement. The improvement of transversal skills in an educational institution is mainly related to the interaction between the student and the teacher, in which the teacher's methodically based activity is directed towards the improvement of various students' skills and continuous self-education of the educator. The cornerstone of the educational process: school - teacher - student, which reflects fully the engagement of the educational institution and the teacher in the purposeful and systematic improvement of students' transversal learning skills, including the components of informal education in connection with the real-life reality and the open educational space in the digital environment. This means that the digital environment component is the new reality both as a knowledge resource and a communication and collaboration tool. The continuous development of technologies, global density of the information field is a challenge for both teachers and students to acquire continuously new opportunities and apply them skilfully in the educational process, respectively, the dimension of lifelong learning has been highlighted.

The findings of modern research show that it is not digital technology resources that are determinant, but rather teachers' digital skills and technology-related teaching skills, so the emphasis changes from the provision of digital technology equipment to the teachers' skills who apply technologies effectively (Sailer et al., 2021). The efficiency of digital learning increases if teachers have mastered technology tools, have developed digital skills and are able to apply them methodically, then students are able to achieve better results.

Since the very frequent application of technology is negatively related to an important transversal skill in the 21<sup>st</sup> century - collaboration in problem solving (PISA 2015 results (volume V): Collaborative problem solving, 2017), it is essential to use technologies meaningfully in the context of digital learning, focusing on quality, not quantity.

## CONCLUSION

Students' digital learning resources for the development of students' transversal skills include such transversal skills that promote competitiveness in the student's life, improve human qualities, increase competence and promote the process of self-education throughout life, adapting to the changing social and cultural environment.

The access to digital technologies, their skilful and meaningful application is a necessary condition for the development of transversal skills and the inculcation of virtues.

Cooperation among teachers, students, parents, as well as with representatives of social institutes as a digital learning resource promotes creativity and entrepreneurship. The

teachers' digital competence in the interaction with the pedagogical competence forms the basis of a modern educational process, but the result also depends on a successful cooperation between the involved parties.

Respecting the levels of cognitive engagement in the availability of activities, a purposeful pedagogical activity and appropriate methodology promote personality development and knowledge acquisition, which ensures the student's self-growth and ability to adapt to changing situations.

The access to digital technologies as digital learning resources affects the inculcation of such students' virtues as responsibility, diligence, courage, wisdom, moderation, solidarity and tolerance, which allows a critical attitude towards the value system acquired during the previous life. It can be complementary, but in some cases contrasting.

Digital learning, which was implemented in the education system during the pandemic as a necessity with no alternatives, revealed the advantages of digitization in order to acquire effectively the level of education defined in the educational standards. However, the risks of the long-term impact of isolation on the students' psycho-emotional state, the desire to implement mutual contact in a real environment have not been excluded.

## SUGGESTION

Education policymakers at the state and municipal level need to organize the compilation and promotion of positive experiences of digital learning, allocating resources for a continuous professional educators' development and improvement of the educational process management.

Conduct continuous monitoring and feedback analysis of educational quality, including purposeful digital learning, at the school and classroom level to make adjustments if necessary.

At the personal level, ensure the the availability of digital learning resources and offer their use based on the offer of activities (constructive, active, interactive) in compliance with the levels of students' cognitive involvement, as well as obtain and analyse the feedback from students in cooperation with administrators of educational processes, teachers and students.

## LIMITATION

The limitations of the study are related to the sample size of the study, the choice of research design and data processing methods. First, the limitation of the study is the relatively small number of respondents (N=73). Since with School Year 2022/2023, the reform of educational content will be implemented in all classes in Latvia applying the competence approach, it is necessary to conduct comparative and longitudinal studies with a representative sample for the justification of its necessity, assessment of its efficiency, improvement of teachers' professional development programmes and methodological support materials for its successful implementation. Perhaps, in the future, it would be useful to conduct an intergroup study that would enable us to compare the educators, school administration representatives and students' opinions, and to determine the age and gender.

## REFERENCES

- Alasa, V., Viavia, M., Shirotriya, A., & Devi, R. (2022). The Impact of Digital Learning during the Covid-19 pandemic on Tertiary Education Students in Fiji. *Journal of Language and Linguistic Studies*, 18(2), 1335-1351. [https://www.researchgate.net/publication/359256029\\_The\\_Impact\\_of\\_Digital\\_Learning\\_during\\_the\\_Covid-19\\_pandemic\\_on\\_Tertiary\\_Education\\_in\\_Fiji](https://www.researchgate.net/publication/359256029_The_Impact_of_Digital_Learning_during_the_Covid-19_pandemic_on_Tertiary_Education_in_Fiji)
- Basak, S.K., Wotto, M., & Bélanger, P. (2018). E-learning, M-learning and D-learning: Conceptual definition and comparative analysis. *E-Learning and Digital Media*, 15(4), 191–216. <https://doi.org/10.1177/2042753018785>
- Beal, C.R., & Cohen, P.R. (2012). Teach Ourselves: Technology to Support Problem Posing in the STEM Classroom. *Creative Education*, 3(4), 513-519. <https://doi.org/10.4236/ce.2012.34078>
- Bersin, J. (2017). How do you define digital learning? <https://www.clomedia.com/2017/06/11/%20define-digital-learning/>
- Blundell, C., Lee, K-T., & Nykvist, S. (2016). Digital learning in schools: Conceptualizing the challenges and influences on teacher practice. *Journal of Information Technology Education: Research*, 15, 535-560. <https://www.informingscience.org/Publications/3578>
- Camilleri, A.C. (2015). *Digital Learning Resources in Education*. LAP LAMBERT Academic Publishing. <https://www.amazon.com/Learning-Resources-Education-Caterina-Camilleri/dp/365976048X>
- Chi, M. T. (2009). Active-constructive-interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, 1(1), 73e105. <https://doi.org/10.1111/j.1756-8765.2008.01005.x>
- Dochevska, Y. (2020). Transversal Skills Correlation to Online Education. *Pedagogy*, 92(7), 47-55. <https://azbuki.bg/wp-content/uploads/2020/09/NSA-Yoanna-Dochevska.pdf>
- Komalasari, K., Fitriyani, S., & Anggraini, D.N. (2021). Living Values-Based Digital Learning Resources in Civic Education. *The New Educational Review*, 85-96. <https://doi.org/10.15804/tner.21.63.1.07>
- Leek, J., & Rojek, M. (2022). Functions of digital learning within the international mobility programme – perspectives of university students and staff from Europe. *Education and Information Technologies*, 27, 6105–6123. <https://link.springer.com/article/10.1007/s10639-021-10855-y>
- Martinsone, K., Pipere, A., Kamerade, D. (2016). *Research: Theory and Practice*. Riga: RaKa. [https://www.researchgate.net/publication/312096048\\_Petnieciba\\_teorija\\_un\\_prakse\\_Research\\_theory\\_and\\_practice](https://www.researchgate.net/publication/312096048_Petnieciba_teorija_un_prakse_Research_theory_and_practice)
- PISA 2015 results (volume V): Collaborative problem solving. (2017). OECD Publishing. <https://doi.org/10.1787/9789264285521-en>
- Pate, S. R. (2019). Effect of Digital Learning on Secondary school students. *Etap Career Advisor*, 23-26. [https://www.researchgate.net/publication/339898989\\_Effect\\_of\\_Digital-learning\\_on\\_Academic\\_achievement\\_of\\_secondary\\_school\\_students](https://www.researchgate.net/publication/339898989_Effect_of_Digital-learning_on_Academic_achievement_of_secondary_school_students)
- Pentang, J. T. (2021). Technological dimensions of globalization across organizations: Inferences for instruction and research. *International Educational Scientific Research Journal*, 7(7), 28-32. <https://doi.org/10.2139/ssrn.3896459>
- Regulations No 416 Regarding the State General Secondary Education Standard and Model General Secondary Education Programmes. (2019). <https://likumi.lv/ta/en/en/id/309597>
- Sailer, M., Murböck, J., & Fischer, F. (2021). Digital learning in schools: What does it take beyond digital technology? *Teaching and Teacher Education*, 103, 103346. <https://doi.org/10.1016/j.tate.2021.103346>
- Seufert, S., Guggemos, J., & Sailer, M. (2021). Technology-related knowledge, skills, and attitudes of pre- and in-service teachers: The current situation and emerging trends. *Computers in Human Behavior*, 115, 106552. <https://doi.org/10.1016/j.chb.2020.106552>
- VanderArk, T., & Schneider, C. (2012). *How Digital Learning Contributes to Deeper Learning*. <https://library.educase.edu/-/media/files/library/2012/12/csd6152a-pdf.pdf>
- Witt, G.L., & Baird, D.E. (2018). *The Gen Z Frequency: How Brands Tune In and Build Credibility*. United Kingdom: London. <https://www.debaird.net/blendededunet/the-gen-z-frequency-derek-baird-how-brands-tune-in-and-build-credibility.html>