TUDÁS MENEDZSMENT

Journal of the University of Pécs
Faculty of Humanities and Social Sciences Institute for Human Development and Cultural Studies

The Future of Learning — Trends in cultural organizations and higher education

Die Zukunft des Lernens – Trends in kulturellen Organisationen und Hochschulen

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Editor's Preface

It is a great pleasure to present the first English-German special issue of the journal Tudásmenedzsment. The special issue „The Future of Learning – Trends in cultural organizations and higher education" consisting of two thematic units, presents the latest research results of 16 authors on learning in cultural organizations and higher education. Of the 9 studies published in the special issue, eight are in English and one is in German. We are very pleased that our authors represent numerous Hungarian and international higher education institutions, and that university lecturers, PhD students, practitioners and MA students alike share their research results in this publication.

The first thematic unit deals with the cultural and social aspects of learning. It gives us great pleasure to publish the studies of university students interested in scientific research, as well as the writings of practitioners dealing with the innovation of learning in this unit. In the second unit colleagues from four Hungarian higher education institutions share their recent research results related to current learning trends in higher education.

I hereby thank the members of the editorial board for preparing the peer reviews of the studies, as well as special thanks to the external reviewers of this publication, dr. habil Ágnes Klein, associate professor at the University of Pécs, and prof. dr. Anton Sterbling, retired professor at the University of the Saxon Police in Rothenburg/OL, who with their thorough peer review contributed to the publication of high-quality articles.

With the publication of this special issue, we wish to create a tradition and hope that the Tudásmenedzsment journal will continue to help the development of the humanities and social sciences in the coming years by publishing high-quality and current Hungarian and international research results in its annual thematic English-German special issue.

I hereby encourage the professional audience of the journal to publish their current research results in our 2023 English-German special issue entitled "Cross-cultural resilience building".

I wish all our authors and readers exciting and useful research as well as successful publishing activities for the year 2023.

Zsuzsa Koltai
Editor

Trends in learning – Culture and society

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Giulia Biagi

FROM CITY TO LEARNING CITY – THE INVOLVEMENT OF STAKEHOLDERS IN LUCCA AND TRIESTE

Abstract
This paper will elaborate upon the model of the Italian Learning City of Lucca and Trieste, recently entered in the Global Network of the Learning Cities of the UNESCO Institute for Lifelong Learning. In a learning city citizens and institutions must participate to achieve global goals and the mission of the SDGs 2030 Agenda and lifelong learning objectives. Regarding the construction of a learning city the UNESCO UIL has given guidelines and best practices to help this transformation, which manifest as a unique process in every city. Through the Italian policies on adult education and the local administrative decentralization has been possible the integration of the UNESCO learning city model with the experiences of Lucca and Trieste on national territory. The involvement of stakeholders is a fundamental step to transform the city, in a city that learns. The actors involved included a wide variety of subjects like civil society, schools and businesses. The question aims to answer how it is built and implemented in a learning city or smart city the stakeholders' network. The hypothesis is that through the comparison of Lucca and Trieste, the best practices produced will emerge. The data are interpreted through: main goals of the learning cities, issues in the community learning activities, barriers of collaboration of stakeholders, forms of collecting and sharing knowledge in the city. Taking into account the UNESCO UIL guidelines. Every learning city needs participation involving all stakeholders and to include all citizens facing challenges at many levels. It will therefore be essential for administrations to reduce the barriers to participation, meet the needs of its population and create learning events to share and acquire knowledge.

Keywords: adult education; university outreach; public engagement

Introduction

The debate on education and learning, their strategies and those problems that have influenced this topic, started in the last century, especially in Europe. Education is at the heart of the response to the challenges of the 21st century, such as the fight against illiteracy, as well as the importance of basic education and its link with economic development, to improve citizen's employability and reduce structural unemployment, hitting the less qualified.

Many documents have been produced in the last few decades, to make lifelong learning a reality, and two important reports commissioned by the United Nations Educational, Scientific and Cultural Organization (UNESCO) influenced this debate on lifelong learning and adult education. One is "Learning to be", also known as "The Faure report" (1972), where "the idea of lifelong education is the keystone of the learning society" (Faure et al., 1972, p. 181) and "the normal culmination of the educational process is adult education"

(Faure et al., 1972). The report appealed to UNESCO Member States to re-organize their educational structures towards two trajectories where, on one side all agencies are transformed to become providers of education and on the other side, all citizens are engaged in learning and able to take full advantage of the opportunities provided by the learning society (Osborne et al., 2013). The EU referred to the concept of lifelong learning for the first time in the white papers on "Growth, Competitiveness, Employment" (European Commission, Secretariat-General, 1994) and a few years later Jacques Delors, presented the report drawn up for UNESCO by the International Commission on Education for the 21st century where "the Commission considers education policies as a permanent process of enrichment of knowledge, but also and above all as a privileged construction of the person and the relations between individuals, between groups, between nations." (Delors, 1996, p. 10).

The expression lifelong learning started to be used to denote a new paradigm, a conceptual shift, which is part of a wider process of individualization that emerged at the end of the last century (Federighi, 2000), which today has become the guiding principle, a vision for participation across the learning contexts. After this breakthrough, the Memorandum on Lifelong Learning issued by the European Commission in 2020 represented the beginning of actions and strategies for education and learning, such as, promoting the renewal of the skills needed for sustained participation in the knowledge society, and investment in human resources (Commission of the European Communities, 2000). It expanded the concept that learning and also teaching happens in formal, non-formal and informal dimensions. The main shift in this document is the introduction of bottom-up procedures and processes, based on the needs of the learners and the impulse to transform the function of the local authorities from passive implementers of national government policy into regional innovators in learning (Longworth, 2006). The city came to be considered as a hub of learning organizations, which brought on a very important modification in the adult educational field. With the strategic goal set by the Lisbon Strategy to make Europe "the world's most competitive and dynamic knowledge-based economy, capable of sustainable economic growth, with more and better jobs and greater social cohesion", the Commission of the European Union (2000, para. 5), pushes the target even further. In 2011, after publication of several documents, papers and reports, the Renewed Agenda, aimed at "Making lifelong learning and mobility a reality" (EU Council, 2011, p.5), became a vital component of the European Commission's adult learning policies with an increasing emphasis on regions as a fundamental site for that learning.

The idea of learning being place-based and focused on the region, city, town or community can be traced back to ancient Greece around 2,500 years ago, with Plato in its Republic, although it was not labeled as such until the late 20th century (Osborne et al., 2013). In the 1970s, the Organization for Economic Cooperation and Development (OECD) funded a project to create "Educating Cities" and only afterwards, in 1992 during the Educating Cities Conference in Gothenburg the two concepts of cities and lifelong learning were again combined together. The paper was an attempt to discover a strategy to create at a city level an urban culture of lifelong learning (Hirsch, 1992). Today a new

UNESCO report, "Reimagining Our Futures Together: A New Social Contract for Education" takes stock of the current situation and lays the foundations for a new social contract for education where the importance of networks comes back predominantly (UNESCO, 2021).

What is a learning city?

Around 3.5 billion people live in cities, a number that is projected to increase to 5 billion by 2030 (UIL, n.d.). Cities around the world face acute challenges in managing rapid urbanization with mass migration from rural areas, responding to human rights problems and growing inequality. In many cities these factors are accompanied by social fragmentation and the loss of shared community identity and vision. All of these issues have a severe impact on ensuring quality education for all. Therefore, lifelong learning and adult educators have a vital role to play in empowering citizens and effecting a transition to sustainable societies.

In the last two decades, UNESCO has influenced adult learning and education; it has created several platforms like the UIL, UNESCO Institute for Lifelong Learning to gather all stakeholders together in countries and regions responsible for the promotion of adult education. From these initiatives are born the Learning Cities and the promotion of a policy model community-focused, where its success depends on local and regional factors related to economic, social, political and other structures (Slowey, 2017).

When local governments empower communities and social actors to engage in the implementation of lifelong learning strategies and programs, they aim at the achievement of the Sustainable Development Goals (SDGs). The Sustainable Development Agenda 2030 of the United Nations, seeks to ensure healthy, safe and prosperous living environments for everyone, in the present and in the future generations, to re-evaluate our dominant models of social and economic development, globally and locally (ONU, 2015).Moreover, intend to narrow the gender gap in and through education, support societies to be more productive, resilient, democratic, peaceful and innovative.

In 2015 the guiding documents of the UNESCO Global Network of Learning Cities (GNLC) define a "learning city as a city that promotes lifelong learning for all as a fundamental principle and:

- Effectively mobilizes its resources in every sector to promote inclusive learning from basic to higher education;
- Revitalizes learning in families and communities;
- Facilitates learning for and in the workplace;
- Extends the use of modern learning technologies;
- Enhances quality and excellence in learning;
- Fosters a culture of learning throughout life.

In doing so, the city hopes to enhance individual empowerment, social cohesion, economic and cultural prosperity, and sustainable development" (UIL, n.d.).

Every city is unique in its cultural, socio-economic settings and those cities all around the world that aim at transforming themselves into learning cities, can follow the UIL instructions or watch their videos tutorial and join the UNESCO GNLC. In October 2018 UNESCO launched a series of video tutorials to inspire leaders, politics, education experts, policy makers, city administrators, urban planners, to build a learning city. The steps to become a UNESCO learning city includes six areas: planning, involving stakeholders, celebrating learning, promoting accessibility, monitoring and evaluating progress as well as mobilizing resources (UIL, 2015a).

In 2013 during the first International Conference on Learning Cities (ICLC), the concept of a learning city was defined in the Beijing Declaration and developed further in the key features of learning cities (UIL, 2013). Further conferences and declarations outlined other strategic directions, like expanding the UNESCO GNLC and opening membership to all cities in UNESCO Member States that wish to implement the key features of learning cities. In 2015 UNESCO created the GNLC, an international policy-oriented network, which today counts 229 cities in 64 countries and it is coordinated by the UNESCO UIL (UIL, 2015b). The GNLC supports its member cities at all stages of development to share ideas and best practices, to benefit from their experience and find solutions to common challenges. It also supports developing tools and instruments to design, implement and monitor learning cities' strategies. Every two years the cities unite to share challenges and solutions to promote lifelong learning in the respective countries. For the 5th International Conference on Learning Cities in 2021, held in Yeonsu, Republic of Korea, the main focus has been dedicated to building healthy and resilient cities through learning. Due to the unprecedented crisis that emerged with the pandemic, endangering the health of populations, with more than half of humanity living in urban areas, cities have a key role in promoting learning for health and strengthening resilience and to reinforce the effort of the cities and the quality of the partnership (UIL, 2021a).

The network follows the guidelines of the 2030 Agenda and its seventeen Sustainable Development Goals (SDGs) to transmute the global goals into local actions. If initially the SDG 4 to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" and SDG 11 to "Make cities and human settlements inclusive, safe, resilient and sustainable" were priorities, the Network supports its focus also on SDG 5. Education is key to enhancing gender equality and with more than half of the world population living in urban areas, cities are at the forefront. Unfortunately, gender equality in learning and education remains a challenge in many cities around the world, with social norms, stereotyping and a lack of understanding around gender issues. Furthermore, educated mothers have a positive health impact on their own lives and that of their children. Increasing financial investment in the education of women will generate disproportionate savings in health budgets (Nemeth, 2020).

Inspiring and significant case studies have been collected by the GNLC worldwide providing guidance for lifelong learning activities. The examples range from the promotion of inclusion to experiences realized focusing on cultural heritage, bringing together culture, art and learning, enabling people to access their cultural identities and to promote

intercultural tolerance (UIL, 2017) and last but not least, create civic participation networks that encourage citizens to take part in the city's decision-making processes, supported by the use of social media and modern technologies (UIL, 2015c).

Definition of the problem and research question

In Italy public policies over the past two decades have progressively introduced different forms of financing individual demand for training. The budget laws and the National Plan for Recovery and Resilience in 2021 are inspired by a strategy that tends to give priority to investment in training in favor of the highly skilled adults, of those to whom is attributed a function of driving the economy towards new scenarios (Del Gobbo, 2021). OECD reports reveal how in Italy only a small percentage of adults are interested in continuing education and also, the low incidence of the educational institution on the majority of Italians (OECD, 2019). This data opens the debate for the recognition of non-formal education, which does not have a national legal framework and cannot yet answer to quality criteria. That explains in fact, the high levels of illiteracy of Italians, not only instrumental, but also social, cultural, environmental. All these factors relate with the work issue of the educational working professions, which struggle to match the market and be involved in the hidden non-formal education (Orefice & Corbi, 2017). Considering the Italian political scenario concerning adult learning and education, learning cities appeal to the need of a bottom-up strategy, where the dimensions of citizenship education is central. In Italy partnerships are favored by local authorities, because the Italian administrative decentralization confers certain powers and responsibility to local authorities like municipalities and provinces, giving them autonomy.

In order to reach these objectives, among the six steps indicated to build a UNESCO learning city, "involving stakeholders" present on a territory, represents one of the initial challenges to become a full-fledged learning city. The UIL guidelines and the online tutorial of UIL are giving much information about the various steps and the strategy to use, regarding the involvement of all stakeholders in their diversity (UIL, 2015a). To do so it is necessary the creation of a coordinated structure able to link the local with the national development, where all organizations and citizens can participate. A structure able to define roles and responsibilities of all stakeholders and require their participation to build the learning city, through dialogue, consensus on the principles and mutual trust. Signing a learning chart or declaration, with an event hosting it, where stakeholders take the responsibility to commit to lifelong learning, it is a proven successful practice that the UNESCO guidelines evidence.

The establishment of a committee of representatives from different sectors, - or a similar form - is essential in the design and implementation of the learning city. When we think about the actors involved, we can consider a broad variety of subjects coming from: civil society, local business, school and colleges, different neighborhoods, community organizations and individual organizations. Their know-how has the potential to strengthen and transform the learning city. One of the first steps indicated is to start with the stakeholder mapping, that can help to identify new potential stakeholders from areas not considered yet and strengthen collaboration, enable governance to calculate and predict possible

scenarios and promptly intervene. Stakeholders should be involved in the whole circle of building a learning city, from planning to implementation and evaluation, building a shared vision they can enrich the city's learning environment. The network should also be expanded by the creation of dedicated spaces, forums, and events that have a central role to introduce new people to the concept of the learning city. In these spaces, people can contribute personally and share experiences or form alliances with other cities, nationally and internationally, in order to share knowledge and best practices (UIL, 2015b). Connections outside the city, with the national ministry of education or relevant institutions from all the sectors, will build political support and increase resources available to the learning city.

This work focuses on the stage of the construction of the network, how it is consolidated and the state of involvement of the local community aiming at answering this question: how is the network of stakeholders built in a learning city? Because what is it that transforms the city into a city that learns if not the participation of all stakeholders?

Research design and methods

To answer this question, this paper compares Lucca and Trieste as case studies of Italian learning cities to identify: the main goals of the learning cities, issues in the community learning activities, the barriers of collaboration of stakeholders, and forms of collecting and sharing knowledge in the learning cities. In particular, the stage of building and consolidating the stakeholders' network will be explored. The challenges of learning cities that apply at a local level the policies of the European Community and SDGs of the Agenda 2030, can find virtuous solutions from experiences realized by other learning cities in the world, which have shared their best practices in the GNLC. Having been identified in several documents from UIL (UIL, 2015c; UIL, 2017), comparative research of learning cities has become an important issue for adult education and lifelong learning in several aspects. This work was born to carry out comparative research at the international level for the International and Comparative Studies in Adult Education and Lifelong Learning (INTALL) of the 2022 edition of the Winter School, hosted by the University of Würzburg. The purpose is to show how it has been possible to transform a city into a city that learns, respecting given questions, contexts and categories.

The literature analysis detected the presence of learning cities in Italy and from the scientific literature, identified experiences of learning cities and regions. On national and international literature like the UIL website (https://uil.unesco.org), PASCAL Observatory (http://pascalobservatory.org/) and through the work done by Roberta Piazza of the University of Catania, some information has emerged (Laitinen, Piazza, & Stenvall, 2017). For some cases it has been possible to find documentation and information also on social networks of the Italian learning cities or formal agreements on cities websites, mostly it is rare to find papers, reports and evaluation of progress required to a city that is building a learning city. The study focused on the local level and started taking into account the learning city of Lucca, which has been the first to be thoroughly investigated. In a second moment Trieste has been included into the study and compared with the other Italian learning city. The learning cities of Lucca and Trieste have been chosen because

they represent two of the five learning cities in Italy that have recently joined the GNLC UNESCO in 2020. Today they are both in the process of the involvement of stakeholders and engagement of the community, with the community, in the effort to equip citizenry with fundamental skills and give proper life to a city that learns. Meaning, identify the composition of the stakeholders and possible challenges of participation trying to understand the process of this transformation.

The hypothesis is that to ensure a change of the city, the Italian learning cities have produced best practices in line with those elements required by the GNLC UNESCO. The research approach is qualitative, because methods and tools have been used with the possibility of tracing and interpreting in depth those practices that emerged during the implementation of UNESCO guidelines. The method used is the multiple case study that allows us to compare the practices that have taken place and whether good practices have been produced in Lucca and Trieste. The case study is presented as multi-stakeholders, because different types of actors have been examined. For this paper four privileged actors have been interviewed, three for the city of Lucca, and one for the city of Trieste. The interviews (See Appendix 1 for the fixed questions of the semi-structured interviews) were carried out in January 2022. The sample was selected on the basis of representative elements characterizing the three levels that contribute to the involvement of stakeholder, allowing an in-depth interpretation of the phenomenon from a political, international, operational point of view. The semi-structured interview with open-ended questions gave the opportunity to explore the areas of interest through a base of predefined questions, taking into account the topics required from this research.

The data analysis is done by categories, collected through the interviews whose units of meaning, as mentioned above, were partly predetermined during the drafting of the interview questions and partly emerged during the drafting. Subsequently the data have been elaborated and interpreted in the light of those elements that have determined a specific mode of intervention by the privileged actors and understand, which conditions allow or not the involvement of the stakeholder in the learning city. The triangulation was made among data for Lucca and the limited time for the research did not allow for a broader comparison with other Italian learning cities.

The learning cities of Lucca and Trieste

In 2015 the UNESCO Learning City Awards were born, with the aim of encouraging and rewarding progress made in developing learning cities around the world. The Award is awarded to cities that achieve exceptional requirements in promoting lifelong learning. The Italian cities in the network are Turin, Fermo, Palermo and in 2020 both Lucca and Trieste joined the UNESCO GNLC. The cities have shown that effective lifelong learning policies and practices can support the development of inclusive, safe, resilient and sustainable cities and thus contribute to the 2030 Agenda. The clusters are the topics identified as high priority that help member cities to network more closely with those learning cities that share their same cluster (UIL, 2021b).

In 2020 both Lucca and Trieste joined the GNLC representing the youngest Italian learning cities today committed to face the first steps of building a learning city and the

involvement of all the stakeholders. The two cities have some similarities like the presence on the territory of two of the 13 special statute PhD schools present in Italy: the IMT Alti Studi Lucca and the Abdus Salam in Trieste. Lucca is in the cluster of Education for Sustainable Development like Hamburg and Shanghai.

Trieste is a crossroads of cultures, religions and ethnic groups and is characterized by a very wide participation in educational and cultural events. With a solid presence, since the 1960s of important schools in the scientific field, it has a very high density of researchers recording a high volume of research produced. With this exceptional percentage of researchers, the city has characterized itself as a City of Science, with a high participation of citizens and their representatives. For the moment it is in multiple clusters and it is developing approaches and actions that configure the future city as a smart city.

Main goals of the learning cities

In the learning city school will not be the only institution to provide education and all sectors must participate in the promotion of education. The interviewee for the politics of Lucca explains how Italy has a solid school education system but there is no structured system of lifelong learning. There are some indicators but the transition to the operational level has to be made. The motivations that are shaping Lucca's learning city model starts in 2017-2018, from the analysis of social issues and research on Martha Nussbaum's capability approach theory (Nussbaum, 2001). All people need tools for social interaction and to solve problems. Leveraging people's skills that might sometimes be not present, explicit or hidden, is an important goal for Lucca's policies. Especially for that part of the population, which does not have these tools. The issues that influence participation in the learning city are strictly related to citizen skills, in Lucca there is 28% of functional illiteracy in adults (Lucca Lifelong Learning, 2021) and needs to counteract early school leaving, improve inclusion and quality of education from the nursery to higher education, increase the number of female graduates, increase the skills of all adults.

In its application to UNESCO GNLC the city of Lucca identified 4 objectives: the creation of a map of the stakeholders who offer training on the territory, the creation of an observatory, the creation of an orientation help desk, based on the storytelling orientation approach and last but not least the creation of a recognition of non-formal paths. Lucca expects to accomplish all these steps for next year (Interviewee 1, Lucca policy level). The map is the first tool created to involve citizens and networks. It represents a step to raise the level of training and participation and shows that within the territory there is a training network that communicates.

Trieste's goals regard the development of approaches and actions to become a smart city taking into account the indications of the 2030 Agenda. The city wants to develop and integrate activities in the field of lifelong learning in these three areas: scientific publication, culture, inclusion of disadvantaged people and the aim is to increase scientific dissemination at every level. The intention is to create interest among citizens and promote the start-up of sustainable economic activities in innovative, high-tech sectors based on clean production (Interviewee 4, Trieste international level). In 2021 a dedicated Urban Center was opened to support business start-ups with many activities for

students and citizens. The aim, like Lucca, is to increase the participation of citizens, stakeholders, organizations that carry out lifelong learning actions (Interviewee 4, Trieste international level).

Issues in the community learning activities

Both Lucca and Trieste face the challenges to increase the participants in the learning activities and the identification of educational needs expressed by the various social groups. Trieste, in line with the objectives of becoming a smart city, shows also the necessity to increase the operational autonomy of stakeholders.

The interviewee for the international level in Lucca highlighted how dialogue for a small city is fundamental to get to know the stakeholders, understand their needs and increase participation. One of the first steps to make the community participate is to build a stakeholder map. The map is a first way to allow citizens and public governance to meet and know each other; it represents the top view of the Municipality of Lucca with all the 120 subjects who signed the contract for lifelong learning considered as a common good (Città di Lucca. n.d.). The interviewee for the policy of Lucca learning city explain that, when the application for UNESCO has been submitted, the presence in the city of some high-level educational institutions such as IMT Scuola Alti Studi Lucca which offers PhD courses, and the University Campus Foundation in the Sciences of Tourism have been indicated but also other small realities that offer a number of initiatives in the territory frequented by adults in different phases of their life (Interviewee 1, Lucca policy level). The interviewee involved in the construction of the map at an operational level, describe how icons and the legend represent the various entities, which are divided according to the sector of interest like, cultural associations, museums, sports associations, institutions (Interviewee 2, Lucca operational level). It has the potential to enable not only Lucca's citizens to participate but also everyone interested in it. The map of the training opportunities is created also for those who find themselves in a disadvantaged situation and often are not aware of it or unable to participate due to timetable or distances (Città di Lucca, n.d.).

In Lucca there is an experiment going on regarding the increase in participation and it is connected with the creation of an orientation help desk. This experiment will anticipate what the national legal framework of 2012 already established. The employment center has not already developed what the national system of certification has committed to them and this experimentation is trying to find a way to recognize, where possible, non-formal educational experiences. The UNESCO chair of the University of Ferrara and of the current Italian Minister of Education, is conducting a statistical analysis of all the 120 realities that have signed the contract for lifelong learning. From the result of this research and other experimental practices, a model will be built (Interviewee 3, Lucca international level).

Another big issue influencing the participation of the community that both Lucca and Trieste faced in these years, is represented by "the new normality" imposed by the pandemic. The use of social media and online conferences gave the possibility to participate in learning events but the digital divide and the difficulties of some to access and interact must be considered.

Barriers of collaboration of stakeholders

The impact of relevant policy, law and financing is crucial to enable the collaboration of stakeholders. In the agreement between the various subjects, mapping all the stakeholders in Lucca gives the possibility to know which institution offers education.

As part of Lucca's cluster, there is the will to try to implement the strategy of leaving no one behind in a process carried out with the actors of society. An important way to implement and consolidate the stakeholder network is represented by contracts. Generally, the contracts are made with institutions, while Lucca's contract is made with citizens (Interviewee 3, Lucca international level). The date set on the contract becomes a symbol for the community of actions that will bring together local administrations, authorities, the world of schools, associations and individual citizens. In Lucca the contract for lifelong learning was considered as a common good created by the "Shared administration regulation", which the city council had approved since 2017. The contract represents a tool aimed at channeling the proactive energies of the city in order to stimulate the educational training processes both in the formal and in the informal, non-formal training (Interviewee 3, Lucca international level).

Learning in the learning city happens in between global and local realities at different levels. As it is possible to see in the construction of the candidates for UNESCO GNLC Lucca referred to 4 fundamental SDGs, integrating the most important SDGs for building learning cities with a personalization and they are: the 4th for quality education and the 10th concerning the overcoming of inequalities (ONU, 2015). In Lucca's case, the 10th has been included to allow the community to access its resources and build its future fighting against social inequalities. The next SDGs included is the 5th, gender equality and last but not least the 11th, dedicated to sustainability and building sustainable communities (Interviewee 1, Lucca policy level). There are many different levels of governance and all these are important global issues that need to be implemented at a local level. Taking inspiration from other learning cities models helps to find answers to these challenges.

The survey revealed how for Trieste too, contracts or other formal way to establish relations among the stakeholders are an important way to implement and consolidate the network. For example, the city signed a protocol in the field of "scientific dissemination" for *Trieste città della conoscenza* between the Municipality and representatives of the scientific world in 2017, counting 18 signatories (Protocollo d'intesa. Trieste città della conoscenza, n.d.). In the cultural field, the *Patto di Trieste della lettura* with 130 signatories from 2018, unites public institutions, publishers, booksellers, theaters, theater companies, academic institutions with the aim to activate new exchanges and cultural initiatives (Patto di trieste per la lettura, n.d.). In the social field, the *Piano di Zona* with 170

subscribers from 2013 defines the integrated socio-health planning and start socio-educational policies and interventions through a strong network of stakeholders (Accordo di programma per l'approvazione del piano di zona 2013-2015, n.d.). Moreover, the consolidation of the network is strengthened by co-realization of projects and events with different partners, through institutional sponsorship, promotion and communication activities. Among the problems related to the barrier of collaboration of relevant stakeholders, the burdens in terms of human resources employed or the timing required for their organization, generates some difficulties in institutional participation.

What is different about the use of the contracts from the two cities, is that Lucca is associated with around 50 universities around Italy but the association has been done also with all other realities. In addition, the technical-scientific committee with different figures gives important guidelines to the political choices (Interviewee 3, Lucca international level).

Forms of collecting and sharing knowledge in the learning city

Learning cities are an extraordinary example of a community of knowledge, with experiences ranging from the work of an association dealing with ancient traditions that want to keep alive the oral memories or even those of the trades. Up to more structured things, but what matters is that every subject, every single reality of the territory feels involved (Interviewee 3, Lucca international level).

The roles of adult educators in the development of learning cities towards SDGs, is crucial to manage the process, guide and make governance and policies operational. The celebratory events that a learning city must promote need adult educators with the ability to organize learning festivals focused on the community and its needs with the aim to raise participation, develop knowledge and skills. Adult educators will be needed in all communities that learn how to learn and leverage on the transformative power of education, at every age. The roles that adult educators can assume in learning cities range from research to administration, project management, instructional design, orientation, and much more to raise the quality of the education, engagement and participation. Media and social media especially during the pandemic have brought many benefits to public discourse and collaborations around learning. The majority of the events took place online and the use of social media like Facebook and YouTube represent an effective way to advertise the events and make them more visible.

The learning fest or events organized for the learning city have an important function of dissemination of knowledge and produce an impact on adult learners. For the second year Lucca organized the "World education day", where some of the partners presented their research along with talk about the strategic lines and positions that UNESCO implemented (Interviewee 3, Lucca international level). Another interesting event that Lucca created is the "Citizenship school", to develop relationships of mutual trust and motivation for active citizenship. In the "Week of Education for Sustainability", schools meet the world of production and businesses, to present initiatives of companies that aim at being sustainable, modifying their production processes or recovering waste, with a view to the circular economy (Interviewee 1, Lucca policy level).

Trieste has recently been selected as the host city of the "EuroScience Open Forum" (ESOF) 2020, the most important scientific event in Europe (Interviewee 4, Trieste international level). An important achievement that triggers both offer and participation

Conclusions

From the data gathered through the interviews, this work revealed that the two Italian learning cities of Lucca and Trieste produced good practices in line with the UNESCO guidelines on the construction and implementation of the network of stakeholders.

In these cases the UNESCO learning city models are applied with the objectives of developing citizen's knowledge and skills, creating easily accessible learning opportunities on these territories, improve the quality of education for sustainable development and sustainability, promote university-community partnerships, create virtual and face-to-face events with a network of public institutions, academic and local stakeholders, in the intent to create valuable opportunities, both for teaching and for learning. The agreements result in actions able to face some of the problems that prevent the full involvement of stakeholders. The management of the participatory process and co-construction of solutions takes into account many levels and factors that are constantly changing.

In the 2030 Agenda, there are 17 goals, which have 169 targets and it is necessary to start with these very broad challenges and problems and turn them into local missions endorsed with formal agreements like, contracts or memorandum, which in both cases, Lucca and Trieste did. To achieve these targets many different sectors, have to work together in the long run. The concept of a contract to achieve this mission catalyzes investment in many different sectors and shakes the structure of the organization itself. Public administrations are too vertical, inertial, inflexible and communication is fundamental. All the institutions and every subject present in a city taken alone are not enough to accomplish the mission and dialogue is the only way in a small city to make everyone feel involved. If we want to make a learning city work, the human capital requires a good level of skills, knowledge and basic competencies; in order to solve problems and improve their condition creating a sustainable environment. The goals of the smart city resemble a model similar to Silicon Valley and appear quite far from Italian reality but in Trieste the exceptional percentage of important stakeholders in this field, research production, researchers per inhabitant create the right input for that transformation.

Lucca realized all the suggestions that the UIL indicated for the stakeholders' involvement. The map that Lucca realized is a way to strengthen collaboration and allow governance to predict new possibilities. Like the experiment carried out in collaboration with the UNESCO chair of the University of Ferrara of the Ministry of Education, which is trying to find a recognition of the non-formal educational path and make the 2012 law operational (Interviewee 1, Lucca policy level). The next step will be the creation of an observatory and the storytelling orientation desk. The many national, international connections and the technical-scientific committees, with representatives from different sectors, are showing other evidence of Lucca practices.

If we talk about networks that govern together and find solutions to local problems, the human factor should be taken into consideration (Mumford, 2006). The adult educator's role will be crucial in the learning city, occupying teaching and non-teaching roles, with hybrid competence to trigger innovation and manage the process; meaning, strategies, pedagogical devices and process of knowledge (Del Gobbo et al., 2021; Galeotti, 2020). Climate change is the biggest challenge we have to face and the whole system must be reinvented. Storytelling as a tool suggested also for Lucca's orientation desk, will be important to keep the individual at the center (Boffo & Tomei, 2020). Telling and reinventing stories that some people have already told to solve local problems, ignites passions in the actions of the individual and not fear. Vision is becoming an important competency for the next future, not only to imagine new solutions (Mulgan, 2020) but also to let the individual envision him or herself in that future.

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Annex 1: Fixed questions of the semi-structured interviews (Lucca & Trieste), 2021

1. How was it possible to transform the city of Trieste into a learning city?
2. What are the objectives it intends to achieve?
3. In the Learning City of Trieste model, which challenges or problems influence the community's participation in learning activities?
4. How has the network of stakeholders been consolidated over the years?
5. Do you think there are any obstacles that could affect the collaboration of stakeholders?
6. What role do educational events play in relation to citizen participation?

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POWER AND CULTURE IN PERU: A SOCIOLOGICAL STUDY FROM THE PERSPECTIVE OF REPRESENTATIVES OF THE FRANKFURT SCHOOL

Abstract
Today, political, social and economic norms constantly strive to reduce poverty, boost economic growth, achieve demographic improvements and promote equality and security within a population. However, the urban centralism observed in Peru does not meet these objectives at all levels. Despite the fact that rural communities represent about a third of the population, for many years and as the basis of a historical cultural agreement, they have been little talked about and their potential for development has been underestimated. The exploitation of indigenous labour was normalised under capitalism, making the population identify with this reality as a social norm. Thus, people began to identify with the lifestyle imposed by the culture industry. In the case of the urban population, they came to identify with the associated social factors, such as social status. And in the case of the rural population, they were indoctrinated by being passive recipients of a world that apparently cannot change. This study analyses this problem from an economic, political and cultural perspective under the thinking of the representatives of the Frankfurt School from the perspective of power and culture issues. It seeks to make Peruvian society aware of the need to create a continuing and adult education proposal that stimulates and transforms learning processes in vulnerable populations, as is the case in rural Peru, thus optimising their development as a community for the struggle for social recognition on a cultural and legal level, reducing oppression and achieving reconciliation between the urban and rural areas.

Keywords: Peru; rural communities; lifelong learning

Introduction

In Latin America and the Caribbean, rural communities are often the most socioeconomically and geographically marginalized populations. They face various vulnerabilities, such as discrimination, poor access to health and education services, low social participation, low political representation, unemployment and, consequently, poverty (Economic Commission for Latin America and the Caribbean, 2018; World Bank, 2015).

In line with this argument, several authors agree that there is significant inequality between urban and rural areas, especially in education (Cabrol & Székely, 2012). For example, in terms of educational attainment in Peru, rural communities have the lowest indicators of access to educational services compared to the rest of the population. And it is worth noting that despite the fact that rural Peru represents about one third of the country's population, for many years rural communities were little talked about and their development potential was underestimated (Salazar, 2012).

The year 2020 was proof of this. With the arrival of COVID-19, the Peruvian State ordered the application of various sanitary measures, including social isolation. Faced with this situation, Peruvian schools closed their doors. Under these circumstances, the "I learn at home" project was launched to further develop distance education. However, these measures highlighted the limitations of the educational system in rural communities (Prado, 2020).

In this context, it was observed that the great gap that has existed between the rural and urban worlds throughout history continues to persist. These great inequalities date back to the 16th century, during the colonial period, when social, economic and political privileges prevailed and indigenous peoples worked the land of the Spanish. Rural communities were marginalized and humiliated (Gaudin & Pareyón, 2020).

This situation was observed by politicians and intellectuals such as José Carlos Mariátegui, who tried to rethink the rural situation because, in his opinion, Peru is an agricultural country where the indigenous population should not be subjected to a feudal economic system inherited from colonial times (Ferrari, 1984). Similarly, Gonzales Prada pointed out that although Peru despite being made up of a majority of indigenous people and not members of the social elite, it is weakened by the economic opportunism of its rulers (Largo, 2016). In the field of education, José María Arguedas also proposed valuing rural communities with their characteristics such as culture, language, closeness to nature and education by strengthening their identity (Ortiz, 2014).

Gradually, the situation in rural areas began to change. However, in today's fast-paced world, where political, social and economic norms constantly strive to reduce poverty, boost economic growth, achieve demographic improvements and promote equality and security among the population (UNESCO, 2015), the urban centralism observed in Peru does not meet these objectives at all levels. Given this problem, the following question arises: How to optimize the development of rural communities in Peru?

The objective of this study is, therefore, to carry out a bibliographic review that compiles existing information on the origins of racism, the history of the Incas, the colonial period, the Enlightenment, the cultural industry, commodification and the current social, cultural and economic situation in Latin America and the Caribbean, especially in Peru. On this basis, a study will be carried out on the current Peruvian national perspective from the point of view of the representatives of the Frankfurt School. The study aims to raise awareness of the need for an educational proposal that seeks to optimise the development of rural communities in Peru through continuing and adult education, considering that the promotion of lifelong learning is currently considered the basis for sustainable development in economic, social and environmental terms worldwide (UNESCO, 2015).

Methodology

The study is qualitative in nature. It examines the thinking of researchers and writers using a methodology based on conducting documentary research by collecting written sources to obtain, organize, analyze and systematize the information that supports the work.

The way to carry out the literature review was to conduct an analysis of the history to find an answer to the research question. The criteria included, first, the research design, then the management and implementation of the information, and finally, the communication of the results. Publications, journals, research articles, books, academic papers and websites containing information on the origins of racism, the history of the Incas and the colonial period, the Enlightenment and the culture industry, commodification, the oppression of urban over rural populations in Latin America and the Caribbean, and Peru's current national perspective in social, economic and cultural terms were collected and reviewed. The main source used was the thinking of the representatives of the Frankfurt School (Reyes-Ruiz & Carmona, 2020).

As a guarantee of validity and reliability, and to provide a standard for searching for information in this study, the search protocol for primary studies by Caro, Rodríguez, Calero, Fernández, and Piattini (2015) was considered.

The origin of inequalities between urban and rural areas in Peru

Throughout time, several authors have developed theories on identity, structuring them in relation to psychology, sociology and philosophy, with the aim of answering the questions of the individual: Who am I? and How did I become what I am? (Kant, 1985; Hume, 1985; Leibniz, 1986; Descartes, 1993 and Locke, 1994).

The term identity has been used since classical Greek and Latin as that which is essential in the subject, that which remains over time (Rizzo et al., 2013). That is, what a person was in terms of being, remains so today (Larraín, 2001). Moreover, a person who has consciousness can reflect on what remains in his being and distinguishes him from others (Rizzo et al, 2013).

However, Paul Ricoeur (2006), taking into account the fact that the human being has consciousness, points out that the ability of a person to reflect on himself does not mean that the identity is immutable, since it is through this self-reflection that the human being is able to understand who he was, who he is and who he can become.

Similarly, other authors consider it a social construction through narratives that emerge from the relationship with others within a historical context. Furthermore, they point out that it is difficult to understand a person's identity as something that persists over time, taking into account that human beings are part of an ever-changing social environment in which they are formed and develop (Gergen, 2007; Arcila, Mendoza, Jaramillo & Cañón, 2010).

Likewise, Gergen (2007) postulates that the self-narratives that individuals make about themselves reflect the events that have had a significant impact on their lives over time. From this perspective, identity would be the result of a person's life history in constant interaction with others.

In view of this, it is not clear how the identity of the indigenous people has come to be subjected to the oppression of urban man’s totalitarian capitalism and has been devalued.

In order to better understand the Peruvian reality and provide a response to this question, it is necessary to go back to the earliest origins of racism.

In this context, it should be noted that different authors have interpreted racism in different ways, which raises the question of whether it should be considered a transhistorical or exclusively modern phenomenon. Using this argument, several researchers deny any racism before the modern era and have even attempted to create a linear history of racism that has its origins in the doctrine of blood purification, a system of discrimination that began in modern times in 14th century Spain. Blood purification distinguished between people with "tainted," "impure," or "mixed" blood and people with pure blood (Hering, 2011).

At first it served to discriminate against Spaniards of Jewish descent and later to exclude Spaniards who wanted to settle in America. After the order of expulsion of the Jews, many of them opted to convert to Catholicism in order to receive the same privileges as Christians. In the context of this event, blood purification was used to try to investigate the genealogy of people who wanted to enjoy a certain privilege, with the aim of denying them access to military posts, universities, councils, monasteries and the Inquisition if it was discovered that they had Jewish blood (Hering, 2011).

Similarly, in America, genealogy was applied to anyone who converted to Christianity. For the first time in historiography, the terms "blood" and "race" were used as a technique of exclusion, referring to ancestry and the denial of privilege through genealogy. Likewise, the colonial power singled out Africans and plebeian natives as a source of impurity. However, despite the fact that the indigenous nobility was declared pure and equated to Christians, in Spanish America the purification of blood was associated not only with genealogy but also with skin color, which affected the "non-white" population and qualified them as impure. The principles of "race", "skin color" and "purity" created an appearance of quality and were hereditary. In America, blood purification became a technique of racism by codifying social relations in a hierarchical manner (Hering, 2011).

Moreover, not only social privileges prevailed, but also economic and political privileges. Thus, during the colonial period, the indigenous peoples were forced to cultivate the land for the Spaniards, being marginalized and humiliated. They were subjected to an ideological, economic and political tyranny of conquest (Gaudin & Pareyón, 2020).

On the other hand, in the historical framework of the American continent in pre-Columbian times, there were several empires that fell under the dominion of other nations. However, none of these previous empires had the organization and territorial extension of the Inca nation, which absorbed all the knowledge of the preceding empires (Brito, 2021).

Thus, the Inca Empire was the last great civilization before the Spanish conquest. Its rule was short, about 100 years, and was characterized by being a vast empire culturally and politically unified. The regime was totalitarian. In addition, the empire was made up of a small ethnic group whose true origins are unknown to science. However, the Incas filled this void by creating their own origin myths to justify their expansionism and domination over other non-Inca empires (Brito, 2021).

Inca mythology became a political project of conquest that reinforced their authority in the empire. On this basis, the Incas dominated nature, explained natural phenomena

and indoctrinated the inhabitants with the same way of thinking about the world in order to rule (Levillier, 1956).

In a totalitarian regime, everyone was accountable to the imperial council and the Inca. However, when Huáyna Capac, the last ruler of the empire, became seriously ill and died, the decline of Inca rule began. A succession crisis began that led to the vulnerability of the empire (Pease, 2007).

Thus, upon the arrival of the Spaniards, the Incas were in a difficult political and social situation, so there was no major resistance to the conquest, they were dominated by them and lost the right of ownership of their lands and estates (Pease, 2007).

Subsequently, after the independence of Peru, Simón Bolívar issued a decree in 1825 abolishing the original noble titles as well as those of the Spaniards and ordering the distribution of land to the rural population (Mijares, et al., 2009).

However, this did not prevent the complete dismantling of oppression of the rural population. As a result, many Spaniards continued to be unjust owners or landowners of the rural population's agricultural land. Thus, in the search for greater social justice, the Agrarian Reform was implemented in 1969 to reduce the unequal distribution of land and increase agricultural production and employment. However, since the latifundistas were important representatives of the white elites, they managed to get the National Congress to allocate very limited funds for the preparation of a study on the changes needed in rural areas (Chirinos-Almanza, 2020).

Thus, and in line with the above, a study by the National Institute of Statistics and Informatics (INEI) has shown that this period was marked by a notable technological regression with serious consequences for agricultural production, as haciendas became associative or cooperative enterprises, that is, enterprises in which indigenous tenants joined with landowners to ensure their subsistence and that of their families, subsistence that meant the cheap sale of their labor in the market. These enterprises quickly failed and the vast majority were parceled out or abandoned (Instituto Nacional de Estadística e Informática, 1997).

So, despite the changes that seem to have occurred over time in favor of rural communities, indigenous peoples in contemporary Peru remain among the most socioeconomically and geographically marginalized groups (Economic Commission for Latin America and the Caribbean, 2018; World Bank, 2015).

After the 1970s, the importance of racial racism diminished, but indirect forms of it were disguised within the system to perpetuate social oppression. Thus, White elites began to play a central role in maintaining historical cultural arrangements (Bowser, 2017).

Thus, Bowser (2017) concludes that a movement cannot succeed in undoing a cultural content forged over many generations, but it can reduce it.

Culture industry — the power of the socio-economically strongest over Peruvian society

Once the reason for the oppression of the urban population, represented by the white elites, over the rural population in Peru is understood from this scheme of racism, it is worth mentioning that it is important for any human being who aspires to understand the meaning of "Enlightenment" and the "Cultural Industry".

The Enlightenment is known as the mid-18th century movement that advocated the use of human reason as a tool of knowledge to combat ignorance, tyranny and superstition. It sought a better world by promoting critical thinking in favor of human freedom, human rights, equal opportunities and democracy (Mayos, 2007).

Within the philosophical framework, however, there were various criticisms of the Enlightenment. For example, Hegel criticized its analytical coldness, which prevented reconciliation with dialectics and thus led to violence, such as the French Revolution (Mayos, 2007). Similarly, in 1784, Kant defined it as man's inability to use his reason without depending on others, and he was convinced that the people of the eighteenth century did not live in an enlightened age, but in an age of Enlightenment (Rantis, 2018).

Subsequently, Adorno and Horkheimer described the Enlightenment as totalitarian, since with the aim of freeing man from fear, it ends up being used by man himself as a means of self-preservation, and in the end becomes an instrument of control and domination that transforms man into an oppressor of other men (Tabarasi-Hoffmann, 2009). This being so, they address the idea that in the foundation that guides the Enlightenment also underlies a principle of contradiction that forces enlightening advances in the lives of human beings to become regression (Farina, 2016).

It should be noted that, despite the influence of Freudian thought, the concept of regression is understood in this context not as an important therapeutic factor in pathogenesis (Brito López & Alcaide Troncoso, 2012), but as an instrumentalized justificatory capacity in which economic aspects are put before humanistic ones and the cultural industry takes precedence (Tabarasi-Hoffmann, 2009).

Adorno and Horkheimer, in their work " Culture Industry ", wanted to create a contrast with the concept of "mass culture", where the concept of mass culture refers to a culture that is created directly by the masses, and the culture industry represents a culture that is part of a system in which objects or products are produced exclusively for mass consumption (Rantis, 2018).

Consequently, Adorno and Horkheimer argued that the irrationality of totalitarian capitalism made it impossible to satisfy people's needs (Horkheimer & Adorno, 2008). Then, the culture industry represents a threat to labor, it represents a mass culture created by manipulation and not a spontaneous mass culture. People cannot choose because they are subjected to a system of manipulation in which individuals are classified in a schematic and statistical way. According to their classification, the culture industry offers them what it considers suitable for its domain. The focus is exclusively on investment and economic power (Tabarasi-Hoffmann, 2009). Thus, " the basis on which technology acquires power over society is the power of those whose economic hold over society is greatest" (Horkheimer & Adorno, 2002, p.95).

Proof of this, in the case of the Peruvian reality, is the creation of a mass culture under the manipulation of the white or urban elites after the Spanish conquest, which gave rise to a cultural industry guided by a classist society oppressive of the rural population. Thus, the Peruvian cultural industry is strictly based on investment and elitist economic power. A historical proof of this was the opening of vacancies in the lands and haciendas of the rural communities, where the landowners, that is, the Spaniards, extracted an agricultural surplus from the lands where most of the natural resources were concentrated. In addition, they cultivated most of the land and leased the rest to the indigenous population to ensure cheap and permanent labor for their own enterprise, since the peasants were remunerated with usufruct rights over a small portion of land, which provided them with only an insufficient part of the income for their subsistence (Instituto Nacional de Estadística e Informática, 1997).

The exchange value assigned to education in Peru

Based on the previous chapter, understanding then the cultural industry as a culture that is part of a system in which products are produced exclusively for mass consumption (Rantis, 2018), it is relevant to understand the terms "needs" and "demands", since they are the basis that moves the learning processes and drives the development and planning of continuing and adult education programs.

Both terms include the decision-making processes of individuals. Needs, on the one hand, are characterized by the fact that they are always present in a person's life and are subjective. They represent the personal desires of individuals. On the other hand, demands represent requirements defined at the social, political and economic levels. They tend to be questioned indirectly and relate to the future by demanding education, training, skills acquisition and qualification (Fleige et al., 2019). Needs are concretized in demands (Jäger, n.d.).

However, needs and demands are perceived and interpreted in different ways depending on the research focus of each discipline. Thus, for example, in economics and business, needs and demands are perceived as factors for commodification to the extent that they are understood as factors of production (Sork, 2001). That is, they are subordinated to capital accumulation (Faulstich, 2003) since they represent a demand in the market for an economic good that includes labor and materials with use value or utility, according to Marx's theory (Marx, 1909).

Thus, needs are understood as what is purchased because it is considered useful and can be paid for, and demands are derived from them, i.e., they represent needs charged with purchasing power (Bardmann, 2011).

Based on the above, Adorno and Horkheimer raised arguments about the reification and objectification of culture making it clear that the amount of things for which commodities can be exchanged is defined by the exchange value assigned to the commodity, considering that the exchange value of a commodity must depend on the work that the human being has dedicated to produce it (Martínez, 2015).

However, Marx explains the existence of a fetishism that has its origin in the social character that produces the commodity. That is, it represents a mixture of social and cultural associations that increase the exchange value of a commodity. Thus, things are social products, since they are manufactured from the labor of one person for another, and various factors related to life in society play an important role in the allocation of their exchange value (Marx, 1909).

Thus, education as a useful element, for example, from the economic and business perspective, is perceived as just a necessity. That is to say, education from a capitalist ideology is considered as a necessity to the extent that it can be financed. It only becomes a demand when it awakens purchasing power, and that is why, in a very subtle way, low-income populations are excluded from access to education (Bardmann, 2011).

A clear example of the aforementioned today are the elite schools in Peru. A study by Mauricio Rentería, Álvaro Grompone and Luciana Reátegui (2020) shows that those who occupy the most prestigious and economically privileged positions in the country do not do so because of their skills and efforts, but rather because of their family background and social relations, especially those forged at school. In this way, the school would be playing an especially important role, since it would be considered as an elite school whose exchange value is economically high and happens to be appreciated in a classist society. The greater the need for a good elite education, the higher its exchange value. Education then, becomes in this context a bankable commodity.

However, in the case of rural communities, being populations that have a very low socioeconomic level, many families cannot afford to pay for their children's education and this ends up being one of the main reasons why many young people and adults do not complete their basic education studies (Instituto Nacional de Estadística e Informática, 2020).

In line with the above, Tedesco (2004) points out that all children are born potentially educable, but sometimes the social environment acts as an obstacle that prevents them from developing their potential.

Raising awareness of the need for lifelong learning for the development of rural communities

In line with the previous arguments, Marcuse's proposal of unidimensionality postulated, on the one hand, that under the cultural industry's objective of producing more capital, individuals, who are unconsciously manipulated at a social level, are reified and transformed into work tools. On the other hand, he considered that within this system, the media contribute attitudes, habits, intellectual and emotional reactions that manipulate and indoctrinate people within a society (Marcuse, 1996), thus creating and awakening needs and demands (Bardmann, 2011).

Marcuse points out that this type of organization favors the creation of a false consciousness, which in a moment ceases to be publicity and becomes a way of life. Thus, this type of organization tends to dissolve its members into a mass construct manipulated by the market and attacks individuals by hindering the path that would lead to their optimal

development. In other words, for Marcuse, the technological principles and the development of capitalist civilization hinder the development of human beings, obstruct their intellect and their quality of life (Marcuse, 1996).

In addition to the aforementioned arguments, Freire postulates "banking education". From this theory, the author would describe the Peruvian educational plan as a traditional pedagogy suitable for the "superior" strata of society or those considered "privileged". This would mean that the Peruvian rural population lives under the oppression of groups representing the superior forces. In other words, rural students are oppressed through indoctrination. They are passive recipients of a world that apparently cannot change. Freire pointed out that the more students are indoctrinated and the more passivity is imposed on them, the more they tend to innocently and naively adapt to the world rather than change it. Thus, from the pedagogical point of view, the educator pretends to tell reality and the student tends to absorb and memorize the information without questioning it (Freire, 2020).

Giroux (2011) points out that educational systems and teachers as part of them, make the decision that a course or a subject has a certain content, which is under the influence and motivation of political ideologies. This is why the author postulates "critical pedagogy" as an educational philosophy where teaching is considered as a political act and insists that democracy and social justice are not different from the acts of learning and teaching. Giroux (2011) is in favor of the rejection of pedagogical traditions as a strategy to stimulate critical thinking in the person.

According to the results found in the National Household Survey (ENAHO) by INEI (2020), indigenous populations are the least favored by development policies in Peru. 33.6% of the rural population is considered poor and 7.4% as extremely poor. However, the urban sector, unlike the rural sector, reaches 11.1% of the population considered poor and only 0.7% as extremely poor (Instituto Nacional de Estadística e Informática, 2020).

On the other hand, in terms of unsatisfied basic needs, rural areas are particularly affected, as 81.7% of households lack sanitation, 11.8% of households are overcrowded and 46.4% of households are inadequate. These percentages are much higher than in urban areas. As a result, 78% of children and adolescents in rural communities work to contribute to their families. It was also identified that students in the first grade of primary school are already beginning to participate in activities such as herding and agriculture. The older the age, the higher the percentage of students' participation in these activities. Likewise, being part of these activities allows them to develop productive and social skills, which are not considered within the educational curriculum studied in schools (Instituto Nacional de Estadística e Informática, 2020).

It should also be noted that according to INEI agriculture, fishing and mining generate the greatest movement of the Peruvian economy, representing 25.8% (4 million 268 thousand 600) of the employed population in Peru. Of this percentage, 79.1% are rural residents and 9.8% are urban residents. The commercial sector represents 18.8% (3,109,400,000) of the economically active population. Of this percentage, 24.3% is urban

and 4.0% is rural. Finally, 9.4% (1,550,700,700) are employed in the manufacturing sector, of which 10.4% are urban and 3.7% are rural (Instituto Nacional de Estadística e Informática, 2018).

However, despite statistics showing that the economic activity of rural communities stands out in Peru, the rate of internal migration continues to grow in the country. This is due to the marginalization of indigenous populations and inequality of opportunities (Prado & Rojas, 2019).

In an ethnographic study conducted by Sanchez (2015), based on informal and formal interviews with members of a rural population who have migrated to the capital, it is clear from the responses that community members feel that their rights are not recognized and that they therefore need to migrate in order to have a higher economic income and for their children to have access to education, since they do not earn enough money in rural areas. In addition, from the interviews it is clear that the indigenous people are proud of their culture and demand respect, as they feel mistreated, despite the fact that they are part of society and contribute to its continuous improvement.

There is very little participation of the Peruvian government in rural communities. There is an evident urban centralism that limits rural populations, excluding and discriminating against them. Proof of this is that in the last census conducted by INEI, the results showed that in some rural areas illiteracy increased by 2 or 3 percentage points and was not taken into account by the government and the national press to improve educational and social policies (Prado & Rojas, 2019).

According to UNESCO, the level of illiteracy in Peru is approximately 2,211,000 people. That is, 12.3% of the population. Thus, in the search for opportunities, the search for less poverty and less rurality explain the internal migration in the country, with the objective of acquiring greater access to basic services. However, the rural population's entry into the urban labor market tends to be informal and precarious, which excludes them from the benefits offered by formal jobs (Prado & Rojas, 2019). So, how to optimize the development of rural communities in Peru?

In this perspective, Marcuse argues that changes in the system can be achieved on the basis of two factors. First, it must be kept in mind that a historical context is contingent, that is, as it may occur, it may not occur, and therefore may be subject to change. And secondly, that oppression and domination do not erase the capacities associated with the sensitivity of the subject. The understanding of both factors would lead to the understanding that both are key to a reality in which social development does not go in the opposite direction to the development of its members. Marcuse's objective is, then, to make known through his thought the instruments that would allow a substantial change of man and society through education (Marcuse, 1996).

In the same way, Freire (2020) proposes "the pedagogy of the oppressed" seeking to make oppressed people realize that their reality is an oppressive reality that indoctrinates and manipulates them. Thus, this "realization" should give way to the transformation of the duality "oppressor - oppressed" in order to achieve the pedagogy of humanity.

Therefore, this study seeks to raise awareness in Peruvian society of the need for a proposal in the field of adult education and lifelong learning as a strategy to optimise the

development of rural communities and Peru in general. An educational proposal of this scope would make it possible to optimise the development of indigenous populations.

This branch of education aims to provide non-profit services of public interest. It is oriented towards the needs and demands of the people and strives to be informed by them, but not to create or awaken them. In this context, therefore, the economic and business perspective is not compatible with democracy (Bardmann, 2011).

In this sense, Grotlüschen (2010) proposes the term "interest" as an approach to decoding the needs of individuals from the perspective of adult and continuing education. He points out that the interests that decode the needs of individuals in this educational paradigm are subject to various changes, often influenced by the person's living conditions, work, space and time.

In other words, the demands of lifelong learning derived from lifelong learning needs take into account the social living conditions of potential participants and include their motivations and wishes. Needs and demands make it possible to collect and reflect on information about the specific problems of a community (Jäger, n.d.). It should be emphasised that needs arise from the discrepancy between the competences individuals possess and those they desire (Schlutz, 2006).

Furthermore, the demands of lifelong learning also include the competence requirements placed on a group of people in certain fields of activity, e.g. in a community. Therefore, the requirements of adult and continuing education must be relevant in all social development processes (Jäger, n.d.).

In this way, raising awareness in Peruvian society will allow the initiative to plan and develop educational programmes and offers as a contribution to a social good to emerge.

Once sensitised, it will be important to form groups of adult and continuing education educators and specialists who identify with Peru's development and thus with rural communities. Hence, they will be sufficiently motivated to identify the needs and demands in rural areas.

Following this, more funding will have to be sought for adult and lifelong learning projects. More support from NGOs and international organizations to provide financial assistance. In addition, it is important for representatives of these support agencies to be vigilant that financial support is channelled into improving infrastructure, services and educational projects for rural communities and not remaining in urban Peruvian centralism. Over time, international organizations such as the World Bank, UNESCO, the vhs DVV international and especially the OECD have played an important role of global governance in the development model of Latin American countries, guiding the agenda and education policies of the region (Miranda, 2016), but nevertheless, there have been certain limitations that have not allowed a greater influence of these guidelines in terms of education and development.

It should be noted that access to basic education has improved, but there are still several factors of discrimination against rural communities on the part of the State. Inequality of opportunities persists, with displaced or excluded indigenous populations. Rural communities are disadvantaged and vulnerable to exclusion from these resources (Miranda, 2016).

As soon as funding is secured, the next step will be for the pedagogues and educators representing the project to give young people and adults who have not completed their basic education a second chance to develop their skills through non-traditional education. That is to say, an education that makes the rural population aware of the value of their identity, of their environment as tools for sustainable development and engages them in change. An education that gives more importance to dialogue and experimentation. An education that promotes political and social change in the Peruvian reality. In this way, indigenous peoples will be able to prosper and overcome the social thinking manipulated by the culture industry.

Vocational guidance for young people and adults in rural areas should be carried out on the basis of typical rural occupations and activities, responding to the needs and demands of the region and promoting a sense of identity and belonging through social interaction. Thus, in the case of the youth population, vocational guidance should be experiential, i.e. they will have to identify their skills through practice in the different areas of rural work. In the case of the adult population, on the other hand, the qualities and skills already acquired must be reinforced through a strategy of continuous improvement.

Studies have shown that social interaction within a community plays an important role in the behavior, lifestyle and development of its members and provides an environment full of opportunities. It also allows them to explore and investigate the world and to achieve their common goals. Communities are formed when the subject actively participates in the activities of other members (Santos, 2012).

On the other hand, the principle of the community is the same as that of the family, since from childhood it offers its members the possibility of identifying or not with the model of the adults around them. Thus, the studies conducted by Rosa (2015) on the influence of the family on its members in terms of vocational maturity could be applied to the influence that a community exerts on its inhabitants by providing them with values that awaken in them preferences or inclinations that play an important role when they have to make decisions. A community provides experiences that help its members develop their personalities.

Throughout time, and despite their vulnerability, rural communities have made important contributions that have made Peru a country rich in history, culture and gastronomy. Today, the Peruvian rural economy has improved significantly thanks to the productivity generated by the labor activity in their environment. Indigenous populations have great potential for the future (Salazar, 2012).

Today, it is necessary to reduce inequality between urban and rural areas, enabling the indigenous people to increase their productive efficiency and economic performance, thus reducing migration to the cities and optimising their development as rural communities.

Conclusion

In today's world, children grow up with a large amount of disconnected information without being encouraged to think for themselves and make use of their reason for human development (López Sáenz, 1998). Thus, children grow up under the influence of an ideology created by historical cultural agreements under the dominance of the culture industry.

Proof of this is that in Peru, the irrationality of totalitarian capitalism, through the cultural industry dominated by the urban world, has created a mass culture in which society is manipulated by a social thinking in which the oppression of the rural world and the devaluation of the indigenous labor force has become something apparently "normal".

This being so, to the extent that the exploitation of indigenous labor becomes a commodity, it becomes, according to Adorno (2013), an instrument of power used to establish an effective social order. This social order is achieved, of course, through the normalization of the exploitation of indigenous labor under capitalism, making the population identify with this reality and thus conform to the social norm. As an ideology is constantly repeated in a society, it leads individuals to become familiar with it and the social factors associated with it. They develop a habit of thought that eventually leads them to believe that these thoughts are their own and not those of society. Thus, people conform to this ideology of life because the oppression of the culture industry does not allow them to seek or yearn for anything else and individuals begin to identify with the lifestyle imposed by the culture industry. The urban population begins to identify with the social factors associated with it, such as social status, and adapts and loves what is offered to them because the oppression of the culture industry does not allow them to love anything but what is given to them. And as for the rural population, they are indoctrinated. They are passive recipients of a world that apparently cannot change. The more they are indoctrinated and the more passivity is imposed on them, the more they tend to innocently and naively adapt to the world rather than change it. They accept their reality because they cannot aspire to more than what they are given.

This is why this study aims to raise awareness in Peruvian society of the importance and necessity of social change. A change that starts with the initiative to create adult and continuing education programmes not for rural communities, but of rural communities. A lifelong learning programme that is based on the needs and demands of these communities and is not for profit. A programme that optimizes the development of the rural area and therefore of Peru in general.

In line with the previous argument, Bowser (2017) points out that while a movement cannot succeed in undoing cultural content that has been forged over many generations, it can reduce it. Thus, Marcuse (1996) and Freire (2020) posit education as a solution to the problem of cultural arrangements that run counter to the development of its members.

In this perspective, Marcuse (1996) argues that one has to take into account that the historical context is contingent and therefore changing. Furthermore, he points out that oppression and domination do not erase the capacities associated with the sensitivity of the subject. This would be the key, then, to a reality in which social development optimises

the development of its population. As a consequence, there would be a substantial transformation of the individual and of society through education.

Similarly, Freire (2020) proposes a "pedagogy of the oppressed" that aims to make the oppressed aware that their reality is an oppressive reality that indoctrinates and manipulates them, thus changing the duality "oppressor - oppressed" to achieve a pedagogy of humanity.

Furthermore, in line with Marcuse (1996) and Freire (2020), Fiori (2016) points out that in societies where the interests of the dominant classes prevail, it is necessary to promote a liberating pedagogy to achieve the development of oppressed groups, and in this particular case, of Peruvian rural communities. It is necessary to teach a pedagogy not for rural communities, but of rural communities. A pedagogy that starts from the objective of promoting the self-knowledge and self-esteem of the indigenous population. A pedagogy based on the experiences of these populations that allows them to strengthen their identity.

While it is true that there are currently educational proposals to optimize rural development, they are traditionalist educational proposals. This is why the United Nations Inter-Agency Support Group (IASG) (2014) supports this thinking and points out that for education to be adequate, the participation of rural communities must be taken into account in the development of teaching materials, curricula and the training of educators according to their interests, needs and demands.

Therefore, based on these arguments, this study seeks to make Peruvian society aware of the need to create a continuing and adult education proposal based on the needs and demands of rural populations. It seeks that educators and pedagogues who are specialists in the subject and involved in rural development and in the country in general promote the creation and structuring of these programmes aimed at offering a second chance to all those who did not manage to complete their basic studies or who are on the way to abandoning them. They should be interested in collecting and reflecting on information about the specific problems and interests of potential participants. And thus to apply this information in the planning and development of educational programmes and offers as a contribution to a social good (Jäger, n. d.).

It will be important that educators and specialists take into consideration the application of a vocational orientation that will allow rural populations to value their identity and enhance their capacities based on the recognition of their environment as a working tool for sustainable development. In this way, productive efficiency and economic performance in rural areas should increase and migration to urban areas should decrease. This will generate sustainable development within rural communities in Peru, and thus an improvement at the national level.

However, it should be noted that prior to the initiative to create a continuing education proposal that optimizes the development of rural communities, it is important and a priority to raise funds and monitor the appropriate investment of these funds by NGOs and international organizations in order to improve infrastructure and services in these populations.

In conclusion, this study aims to make Peruvian society aware of the current situation of the country in relation to the existing gaps between urban and rural areas and reflects on the Peruvian situation through the contribution of the ideas and thoughts of the representatives of the Frankfurt School in their approach to questions of power and culture. In this way, it reveals that how these concepts can be used to analyze the development of industrial societies from an economic, political and cultural perspective in order to stimulate and transform learning processes in vulnerable communities, such as rural Peru. As such, it aims to encourage educators and pedagogues specializing in lifelong learning and adult education to create educational proposals to strengthen indigenous identity in the struggle for social recognition on a cultural and legal level, thereby reducing oppression and achieving reconciliation between urban and rural areas.

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WOMEN'S EDUCATION AND THE ACHIEVEMENT OF LEARNING CITIES IN LAGOS, NIGERIA

Abstract
The study sought to examine how women's education can be harnessed to achieve learning cities in Lagos state. The essay evaluates the influence of women's education on the achievement of learning cities in Lagos; finds out how to improve the participation in women's education; examines the form of women's education useful to achieve learning cities in Lagos state and assesses how learning cities can be achieved with women education. Three research questions were raised and answered by the essay. Findings of the study showed that to improve the patronage of women's education in Lagos state, there should be opportunities for women to have basic education, learning programs should be divided into sections (morning, afternoon, and evening), women should be allowed to choose their desire vocations, learning should be made free and accessible and inclusive for all gender and the study recommended that to achieve the learning city in Lagos through women education, there should be opportunities for all women to partake in basic education at their leisure time and their convenient time; women should be given opportunity to learn various entrepreneurship skills or trade as this would enhance their thinking skills and develop them economically and there should be a provision of employment opportunity for women to encourage the non-literate and the potential literate as a result of the new normal.

Keywords: women education; learning cities; learning communities

Introduction

Developing learning cities and learning communities is one of the benchmark of Sustainable Development Goals (SDG) set aside by the world leaders to improve the lives of people in various communities and cities before 2030. At the same time it's not enough to make the promise but to develop effective plans to achieve it is paramount. Meanwhile, various governments and leaders have been paying lip service to the goals while some are trying to meet them, but there is no visible result yet. When it's looking like all hope has been lost since 2030 is just like a day ahead, there is a need for us to approach the development goal with a fresh idea. This could mean educating people from their various homes and convenient places. The only link that could help in doing that is women's education which is an aspect of adult education. Women are that powerful gender that can propagate the importance of education, development, entrepreneurship, well-being, equity and inclusion rapidly. Their education would bridge the gap of gender equality, economic empowerment, justice, no poverty, zero hunger, economic growth and fulfillment of every other goal in the SDG.

Female has so many roles in the development of the nation when compared to men (Walby, 1992). The women retain certain economic opportunities in the social system in the pre-colonial era. The contribution of women to a society's transition from pre-literate to literate likewise is undeniable. Therefore, women education is key to a nation's ability to develop and achieve sustainability targets. Various research such as Walby (1992) and Kolb (2013) have shown that education can improve agricultural productivity, enhance the status of girls and women, reduce population growth rates, enhance environmental protection, and widely raise the standard of living. There are more than enough evidence to show that women could be used to achieve lifelong learning in the society. Nevertheless the literacy rate of men to women is still far compared to the UNESCO standard. Although, 68% of the Nigerian population is literate, and the rate for men (75.7%) is higher than that for women (60.6%) (Ojo & Sarumi, 2019). Therefore if women are given series of education required by them, they would be useful in achieving the feat of learning cities. These has necessitated the research to examine how women education can be harnessed to achieve the feat of life-long learning and learning city in Lagos state, Nigeria.

According to Jordan, Longworth & Osborne (2013) the concept of a "learning society" as appealed to UNESCO Member States means to re-organise their educational structures on two basic premises: (1) all agencies become providers of education; and (2) all citizens are engaged in learning, taking full advantage of the opportunities provided by the learning society i.e all sectors; public administration, industry, communications, transport – must take part in promoting education. Local and national communities are in themselves eminently educative institutions. As Plutarch said, "the City is the best teacher" (Jordan, Longworth & Osborne, 2013, p. 19). And especially when the city is capable of remaining within human proportions, it does indeed contain immense educational potential with its social and administrative structures and its cultural networks not only because of the vitality of the exchanges that go on, but also because it constitutes a school for civic sentiment and fellow-feeling.

Achievement of sustainable development goals before the deadline of 2030 is a benchmark for all nations. Although, various governments and leaders have been paying lip service to the goals while some are trying to meet them, but there efforts are not yielding yet in Africa. With the deadline approaching while it seems that nothing has been achieved, there is a need for approach the development goal with a fresh idea or eye. Studies like Kolb (2013) and Adamu (2013) have showed that to achieve a giant feat in education, women education should be given adequate consideration. This is because women are the most underrated but powerful gender that can echo the rationale for education, development, entrepreneurship, well-being, equity and inclusion rapidly. Their education would therefore improve the gap of gender equality, economic empowerment, justice, no poverty, zero hunger, economic growth and fulfillment of every other goal in the SDG. It appears that there are forms of women education that can help in the achievement of learning cities. It also seems that if women education is carefully harnessed, it will bring about all round development in the state and the whole nation. It is based on these foregoing that the essay want to examine how women education can be harnessed to achieve learning cities in Lagos state.

Research methodology

Aims and objectives

This study attempt to evaluate the influence of women education towards the achievement of learning cities in Lagos state, Nigeria. Specifically, the study sought to:

1. Find out how to improve the participation in women education in Lagos state
2. Examine the form of women education that can be used to achieve learning cities in Lagos state
3. Assess how learning cities can be achieved with women education.

Research questions

The study seeks to provide answers to the following questions;

1. How can patronage of women education be improved in Lagos state?
2. What form of women education can lead to achievement of learning cities?
3. How can learning cities be achieved with women education in Lagos state?

Research hypothesis

H0 Women education do not significantly affect the achievement of learning cities

Research methods

Lagos State was chosen because of its cosmopolitan and unique nature. It is unique because it was formally the federal capital of Nigeria, and so all the ethnic groups of Nigeria are adequately represented in Lagos State because it is also the commercial nerve center of Nigeria. Lagos Mainland is one of the largest local government therefore it would be considered for the study. Lagos Mainland local government has a total population of 629,469 with the women population of 303,036 (Lagos State Government, 2019). Convenient sample technique was used to pick a total sample of 150 women from six different constituent wards out of 11 wards in Lagos Mainland Local Government. The items in the questionnaire would analyzed with the use of simple percentage and Pearson Product Moment Correlation was used to analyze the hypothesis.

Scope or delimitation of study

The study was restricted to women that are age 18 and above in Lagos state as a whole but it was limited to Lagos Mainland local government area because of some constraint such as large population involved in carrying out the survey.

Concept of women education

This section illustrates the role of women's education and how it helps to achieve lifelong learning. Women's education is considered as the key factor in achieving lifelong learning. It is noted that education provides better employment opportunities and enhances development. Similarly, according to Chaudry (1995) educated women have demonstrated a better ability to keep control of their husband's expenditures and to maintain their own economic independence, to improve household management, and be more able to save money and generally contribute more to the development of nation. In this

study, the basic component of the theoretical approaches is lifelong learning and women education furthermore lifelong learning is seen as a form of education that enhance all round development in the citizens of a nation. Any form of education given to women that can help in promoting such development is women education. In this context, humanistic theory of learning propounded by Abraham Maslow (1943) would be considered. Humanistic theory involves learning consciously through watching and observing the behaviour of others and what results from that behaviour. This theory says that individuals have free will and they can actively develop their unlimited potentials and reach the phase of self-actualisation. Therefore, human beings are self-motivated to improve themselves and they always want to improve their competencies because they want to reach the self-actualisation phase. This is where lifelong learning comes into play, self-improvement becomes a continuous process for as long as they learn and live. As people are eager to improve themselves, they also end up improving the immediate society and the nation at large.

The field of adult education has been identified and defined in various ways. Most definitions, however, include all learning by adults, from the casual incidental learning that may occur in the natural societal setting to the systematic learning accomplished in a formal instructional setting. The most accepted definition of adult education is the one giving by UNESCO in 1972 which defines the term "*as the entire body of organized educational processes, whatever the content, level and method, whether formal or otherwise, whether they prolong or replace initial education in schools, colleges and universities as well as in apprenticeship, whereby persons regarded as adult by the society to which they belong develop their abilities, enrich their knowledge, improve their technical or professional qualifications or turn them in a new direction and bring about changes in their attitudes or behaviour in the twofold perspective of full personal development and participation in balanced and independent social, economic and cultural development*" (Jarvis, 1999, p. 9.). In so many instances, adult education can be interchanged with lifelong learning. Lifelong learning is also seen as education which starts from cradle to grave in the life of individuals. This implies that it could be in any form of education with learning value or intention for the adults which includes men and women.

Women's education can be regarded as a kind of knowledge given to women for enhancing their self-respect and self-dignity. This knowledge can be in form of formal, non-formal and informal education, it can also be in form of adult education, community development, workshops, seminars, conferences and training. Women's education is for making women to become economically independent and self-reliant (Bhasin, 1992). Women as mothers, are educators within their families, what they learn, they pass on to their children and their future generations (Osuala, 1987). "*Women need an education which will not only help them in the search and acquisition of new skills and knowledge, but also help them to acquire and strenghten values like justice, equality, honesty, truthfulness and solidarity. Education should help women to develop an analytical and questioning mind and a scientific approach in understanding the realities around them*." (Adamu, 2013, p. 2.). There is compelling evidence that the education of girls and women promotes both individual and national well-being. In developing countries there is strong link between a

woman's education and her employment and income. When women are deprived of an education, individuals, families, and children, as well as the societies in which they live, suffer. When women are adequately educated, everyone benefits including the nation.

Ibara, Ely and Kolb (2013) suggested three actions to support women formal education which may be rooted through the education of the girl-child or education at later life (lifelong learning). These positions are the same idea that can help in redefining women education in a country with high level of illiteracy especially as if affects women literacy like Nigeria. The ideas are as follows; *"(1) educate women and men second-generation gender bias; (2) create safe "identity workspaces" for women to support transition to bigger roles; (3) anchor women's development efforts in a sense of leadership purpose rather than in how they are perceived*" (Ibara, Ely & Kolb, 2013)

Education is central to the development of women leadership role. Second generation gender bias has to do with making both sexes understand the importance of making male and female use their inbuilt ability for the development and upgrade of the society to which they belong and by implication developing themselves and their immediate family. Added to this is the fact that there is the need to make both genders know who they are, know their weaknesses and strengths. Giving an individual relevant role to which he or she is most suitable without bias will help in achievement of goals in organizations. When a woman is educated it is assumed that the whole nation will feel the impact of achievement, when woman assume position of leadership she ensures that her weakness does not overturn her strength. Education is the bedrock of all developments therefore, there is the need to create enabling environment for women to benefit at all levels and for all categories of women.

Women education is an integral part of adult education which can be used in the realization of the sustainable development goal in the society. In the context of today's world, women play different roles from business entrepreneurs to corporate executives, policymakers and political leaders, functioning in different capacities and being actively involved in the struggle for social change up till this moment. Women's organizations have emerged in acting as social actors that promote more equitable participation in all spheres of society while providing effective links among women, governments, and other stakeholders. Gran (2019) opined that women play the largest role in decision-making about family meal planning and diet which initiative helps in preserving child health and nutrition. It is the mother in the family who most often urges children of both genders to attend and stay in school. The role of women is at the front end of the chain of improvements leading to the family's, the community's long-term capacity. It's also eminent to discuss the role of women in the development of learning cities which can also enhanced national development.

UNESCO defined learning cities as a city that effectively mobilizes its resources in every sector to promote inclusive learning from basic to higher education; revitalizes learning in families and communities; facilitates learning for and in the workplace, extends the use of modern technologies; enhances quality and excellence in learning and fosters a culture of learning throughout life (Faure et. al. 1972). An overview of what a city should do be-

fore it can achieve the learning city shows that aside from individual government participation, there is a need for individual active participation. This implies that except if everyone in the city is aware of the benefit of achieving such, they may not participate actively. Meanwhile, UNESCO submitted that for a city to achieve all the feats of a learning city, there must be adequate planning, involvement of everyone in the city in such developmental project, initiation of the process with celebration which would bring more awareness, accessibility of the project by everyone, monitoring and evaluation of the project and adequate funding of the project.

For example, to achieve learning feat through women education, there must be adequate planning with the women in the community because they must all see the benefit of such, otherwise, they may not trust the process. After they have all agreed to participate then the planning process can commence. This involves arranging various meeting with them to know the type of education (basic, functional, vocational, digital, apprenticeship etc) they need at that particular time and give them such education. After they have been given such education, it is believe that they will propagate such to their family, neighbour and everyone they know in the city for them to also be involved in it. Women who easily inform their friends about the program, they would ensure that their immediate family participate in the development program, celebrate the commencement of the program in a larger way.

Lifelong learning (women education) in Nigeria - discussion of findings

The Lagos metropolitan area is a major educational and cultural centre in Sub Saharan Africa. With all the resources government has put in place to improve life-long learning in Lagos state. One would assume that every citizens would be literate by now and thereby contribute their quota to the development of the learning cities and other developmental area but it seems that this is not enough making the time to achieve the sustainable development goals unachievable.

Information on the demographic section of the questionnaire revealed that 32% of the total participants were between 18-30 years of age, 30% of the participants were between 31-40 years, 20% of the participants were between 41-50 years of age and 18.7% of the respondents were 51 years and above. This implies that, majority of the participants were between 31-40 years of age. 26% of the total participants have no formal education, 36% of the participant have basic education, 24.7% have secondary education while 13.3% of the participants have ND/Degree. This suggested that majority of the participants were in service for 6-10 years. 25.3% of the total participants were single, 56.7% of the participants were married, and 18% of the participants were divorced.

Table one shows that 13.3% of the respondents opined that the patronage of women education can be improved by giving all female opportunity to have basic education, 20% opined that the patronage should be improved by dividing learning programme into section (morning, afternoon and evening), 16.7% of the respondents also opined that the patronage of women education could be improved by organizing learning programs in various centres or areas, 20% opined that the patronage could be improved by allowing people to choose different vocations. Also 13.3% are of the opinion that the patronage

could be improved by making learning free and accessible while 16.7% opined that making learning inclusive for all gender would improve patronage of women education.

Table 1: How can patronage of women education be improved in Lagos state? (Research Question#1) (N=150)

Response	Number of Respondent	% of respondents
By giving all female opportunity to have basic education.	20	13.3
By dividing learning programme into section (morning, afternoon and evening)	30	20
By organizing learning programs in various centres or areas	25	16.7
By allowing people to choose different vocations	30	20
By making learning free and accessible	20	13.3
By making learning inclusive for all gender	25	16.7
Total	150	100

Source: own data, 2022

Table 2 shows that 33.3% of the respondents opined that basic education would lead to the achievement of learning cities, 20% suggested that functional education could lead to the achievement of learning cities, 16.7% of the respondents also suggested that entrepreneurship education could lead to the achievement of learning cities in Lagos, 16.7% opined that vocational skills could lead to the achievement of learning cities in Lagos state while 13.3% are of the opinion that digital literacy skills could lead to the achievement of learning cities in Lagos.

Table 2: What form of women education can lead to achievement of learning cities? (Research Question#2) (N=150)

Response	Number of Respondent	% of respondents
Basic education.	50	33.3
Functional education	30	20
Entrepreneurship education	25	16.7
Vocational skills	25	16.7
Digital literacy	20	13.3
Total	150	100

Source: own data, 2022

Table three shows that 30.7% of the respondents opined that sustainable development goals can be achieved through improving literacy rate of women, 17.3% suggested that giving necessary vocational skills to women would help in achieving sustainable development goals, 18.7% of the respondents also suggested that given equal and free access to all form of education would help to achieve sustainable development goal in Lagos, 16.7% opined that sustainable development goals can be achieved by encouraging people to

learn outside the formal education while 16.7% are of the opinion that sustainable development goal can be achieved by encouraging more female in education sector.

Table 3: How can sustainable development goals be achieved with women education in Lagos state? (Research Question#3) (N=150)

Response	**Number of Respondent**	**% of respondents**
By improving literacy rate of women	46	30.7
By giving necessary vocational skills to the women	26	17.3
Given equal and free access to all form of education	28	18.7
By encouraging learning outside the formal education	25	16.7
By encouraging more female in education	25	16.7
Total	150	100

Source: own data, 2022

Table 4 showed the Pearson Product Moment Correlation for women education and the achievement of learning cities. The Pearson product moment correlation index obtained is positive at 'r' = 0.802. The significance or p-value = 0.000 which is less than predetermined alpha=0.05. This result indicated that Women education significantly affect the achievement of learning cities. Therefore, the null hypothesis is rejected while the alternative hypothesis is accepted.

Table 4: Relationship between women education and achievement of learning cities

		WOMEN EDUCATION	**ACHIEVEMENT OF LEARNING CITIES**
Women Education	Pearson correlation Sig. (2-tailed) N	1 150	.802** .000 150
Achievement of Learning Cities	Pearson Correlation Sig. (2-Tailed) N	.802** .000 150	1 150

**Correlation is significant at the 0.05 level (2-tailed).

Source: own data, 2022

Findings from research question one shows that in order to improve the patronage of women education in Lagos state, there should be opportunities for women to have basic education, learning programme should be divided into sections (morning, afternoon and evening), various learning programs should be organized in various centres or areas, women should be allowed to choose different vocations they desire, learning should be made free and accessible and inclusive for all gender. This is also corroborated by UNESCO

which defined learning cities as a city that effectively mobilizes its resources in every sector to promote inclusive learning from basic to higher education; revitalizes learning in families and communities; facilitates learning for and in the workplace, extends the use of modern technologies; enhances quality and excellence in learning and fosters a culture of learning throughout life (Faure et. al., 1972).

Findings from research question two showed that basic education, functional education, entrepreneurship education, vocational skills and digital literacy can lead to the achievement of learning cities in Lagos, Nigeria. If they can be invested in and made use of accurately, the feat of learning cities would be achieved in Lagos, Nigeria. Kolb (2013) also corroborated the study with the suggestion that those educations will give women insight into themselves and their generations. When a woman is educated it is assumed that the whole nation will feel the impact of achievement. Education is the bedrock of all developments therefore, there is the need to create enabling environment for women to benefit at all levels and for all categories of women.

Findings from research question three shows that to achieve sustainable development goal through women education in Lagos state, the literacy rate of women must be improved, necessary vocational skills must be given to the women, equal and free access to all form of education must be provided for women and learning outside the formal education must be encouraged.

Conclusion

It's eminent to note that achievement of learning cities is not a difficult task but it requires necessary planning, funding, monitoring and evaluation of various project. To achieve learning the feat of learning city in Lagos, there should be adequate planning for a program that will encourage the participation of women in all spheres of life and it should be compartmentalized into different sections and time to encourage participation of all. When women are being encouraged to see it as there program and they accept it as one, then there would be adequate result in their various homes, families, households and at the long run the cities and nation at large.

The study recommends that in order to achieve the learning city in Lagos through women education, there should be opportunities for all women to partake in basic education at their leisure time and their convenient time. Women should be given opportunity to learn various entrepreneurship skills or trade as this would enhance their thinking skills and develop them economically. Since women occupy a large space in the world, the state should set a day aside to celebrate women who are literate to encourage the non-literate women. There should also be provision of employment opportunity for women in order to encourage the non-literate and the potential literate as a result of the new normal.

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TECHNOLOGICAL INNOVATION IN LEARNING CITIES AND ADULT EDUCATION PROGRAMMES: A COMPARATIVE ANALYSIS BETWEEN MEXICO AND NIGERIA

Abstract
In contemporary times, technological innovation has become the order of the day, and different sectors have been able to infuse technological innovations to promote their professions and professionalism; thus, technological innovations are considered in adult education programmes to promote learning cities. Technology and innovation direct facilitators and learners to the point of adult learning and the growing technological innovation. Hence, this study seeks to examine technological innovations in learning cities: a comparative between Lagos, Nigeria and Huejotzingo, Mexico. Four research questions were raised to guide this study. The study as well looked at comparative analysis haven established the justification for comparative in this study as the form of technological innovation used to promote adult education programmes, and for the fact that Nigeria and Mexico share similarities in historical background of how technological innovation have been used over time. Convenient sampling technique was used to select 150 respondents in Somolu local government area of Lagos state, Nigeria. Both primary and secondary data were used. The study shows that insufficient or lack of funds which limit institution to have advanced technology tools could be the major factor that hinders the use of advanced technology in the provision of adult education programme. The paper recommends proper funding of life-long learning by the government; technological education should be included in all adult education programmes and made accessible to all within the state to achieve education for all and sustainability in cities and communities.

Keywords: technological innovation; learning cities; adult education

Introduction

For a community to be developed and compete in the digital world we live in, there is an urgent need for the inclusion of technology innovation and equal social activities in adult education programmes. This will enable the learning cities to have a suitable economic standard of living for all without leaving out a group or percentage of the entire community population thereby enhancing equal distributions of opportunities no matter the social status or class one belongs to, be it young or old, literate or illiterate or non-literate. Learning cities (and regions) have emerged as a vehicle to drive place-based lifelong learning across the lifespan through formal, non-formal and informal means. Learning cities and regions have been conceived not only as a means to promote the inclusion of disadvantaged groups but also as a means to foster the development of learning infrastructure to generate inward investment and facilitate business development (Osborne & Hernandez, 2021).

The socio-economic development and opportunities urban learning cities enjoy in our world today did not just fall out of the room, it could be seen as a result of the innovative ideas that were developed and orchestrated in previous years. The implementation of such innovative ideas is made possible as a result of its availability and accessibility to the people in the community regardless of their race, age group, gender and social status. The community members are exposed to skill sets, training and tools that will enable them to improve and increase their income to be able to make sustainable living conditions. Some of these trainings may not be taught within the four walls of the classroom in order to enable equal access to resources by all members of the community, especially the adults. The essence of an infusion of well-planned and inclusive integrated adult education programmes that will encourage technological innovation, introduction and usage of advanced technologies, infusion of technology into daily activities and community development cannot be overemphasized in building learning cities.

Osborne and Hernandez (2021) opined that engagement of human capital resources with effective approaches are essential for creating an innovative and digital solutions that to build the desirable future cities. The current global context of the so-called Fourth Industrial Revolution of fast-paced technological change has put pressure on traditional educational approaches and institutions, calling for us to revisit the learning cities agenda in digital light. It demands a revision of modes of the provision in particular, as well as digital learning engagement and literacy.

Development is not complete if everyone has not contributed to the process within their community. People involved are adults who are the policymakers, and their participation is vital. Therefore, there is a need for adults to be carried along in developments that are sustainable through all the programmes of adult education, interposing them with technological innovations. There is an emphasis on the call for integrated adult education programmes in order to have sustainable community development. In an evolving or relatively new market, there is need to match the supply of skills which is very sacrosanct. However, this requires dexterity and flexibility in education policies which connotes transforming education and training systems such that educational institutions keep pace with technological advancement that can give rise to skills shortages, especially in digital technologies. Furthermore, a holistic approach is required for big data to play an important role in this regard. This also requires collaboration among policymakers, education and training systems, and employers. More often, curricula need to be adapted to emphasize the skills and recalibrate education towards more practical, applied and experimental learning approaches, and the development of skills, competencies and capacities for continuous learning (Taylor, 2003).

It has also been observed that inadequate training deprives adults of creativity and innovation, when adults have skills and adequate training about the internet and technology, there will be an all-around development. A developed community where members can own their wealth, collaborate on activities that foster national security and technological advancement, creatively build innovative projects, revolutionise industries and an equal economic market for all in a conducive living environment. Training on technology innovation and its usage encourages creativity and it has motivated adult learners to take

initiatives that serve as propellants for sustainable socio-economic community development in learning cities.

Problem statement

It is no more news that the era of analogue is fast becoming a thing of the past and at the centre of this evolutionary community development is the technological innovation in learning cities. The more a city embraces technology, the vast opportunities such a community enjoys range from its economic growth, health benefits, the standard of living, etc. A community that fails to embrace technological innovative learning seems to be left behind; it seems that there is a need to have a heterogeneous curriculum and educational programmes that will enlighten the community with more focus on adult education and lifelong learning programmes. It appears that programmes should be powered by the community members' involvement and participation in learning digital skills, methodology, innovations so as to put the learning cities on a global roadmap. Therefore, it is pertinent to do comparative studies of two learning cities – Huetjozingo, Mexico and Lagos, Nigeria. Both driven by their fast technological intervention in restructuring and developing their communities, have been listed as learning cities by UNESCO.

Aims and objectives

This study will attempt to evaluate the technological intervention in the achievement of learning cities in Lagos state, Nigeria. Specifically, the study sought to:

- Find out how technological intervention can be used to achieve lifelong education in Lagos state.
- Determine how introduction of technological innovations into adult education will stimulate creativity in the people of Lagos state.
- Examine how technological intervention can be used to increase sustainability.
- Assess the importance of community involvement and participation in the achievement of learning cities.

Research questions

The study seeks to provide answers to the following questions;

1. How can technological intervention be used to achieve lifelong education in Lagos state?
2. What form of technological innovations will stimulate creativity in the people of Lagos state?
3. How can technological intervention be used to increase sustainability?
4. What is importance of community involvement and participation in the achievement of learning cities?

Scope or delimitation of study

The study was limited to the youths aged 18 (legally recognized age for adulthood in Nigeria) and above within Shomolu Local Government Area in Lagos state due to overpopulation which could pose a constraint in surveying the state.

Technological innovation

Technology involves the purposeful application of knowledge, experience and resources to create products and processes that meet human needs. Information Communication Technology (ICT) is now required for people to function in the modern society and may even be necessary for human survival in the future (Bakare, 2013).

According to Urabe (1988), innovation suggests generating a fresh idea and its implementation in a new product, procedure or service, which leads to a dynamic growth of national economy and increased employment, as well as creating of clear profit for an innovative business organization.

Williams and Graham (2010) assert that technological innovations have spurred potential use of electronic resources for learners of all ages over the last decade. These global developments also require continual advancement of electronic e-learning evaluation.

Technological innovation is expedient in the educational system because of its significant impact at all educational levels. In other words, the need for technological innovation in our educational system cannot be over emphasized as the world is fast becoming a global village. It is also important to note that 'Inclusiveness' can be easily achieved with technological innovations. When we talk about the United Nations 2030 SDG agenda - Leave No One Behind, a lot of people limit it to children, i.e., the less opportune children in rural areas. However, there is no way we can achieve the goal of inclusiveness if the adults who play key roles in policy-making are not up-to-date with technological innovations. For example, a city cannot be regarded as a learning city if more than half of the population are not up to date with trends. Technology is the new trend of creating input to achieve output using specific devices to improve the efficiency and quality. Therefore, application of this to education field has transformed learning in present time.

The importance of ICT cannot be overlooked. On daily basis, there are lots of information circling the globe, and this demands that we avail ourselves of all necessary information through the use of information technology. The adult learner therefore should be exposed to a wide range of information and technology wherewithal to enrich his/her learning experience at their convenience. The emergence of technological innovation has increased a concerted call for learners to take charge of their learning and have a more active role, using the advantage of rich resources for learning made available by information technology e.g., Youtube, E-library, etc.

Learning cities

Learning Cities according to UNESCO, is described as a city that effectively mobilizes its resources in every sector to promote inclusive learning from basic to higher education; revitalizes learning in families and communities; facilitates learning for and in the

workplace; extends the use of modern learning technologies; enhances quality and excellence in learning; and fosters a culture of learning throughout life (Borkowska & Osborne, 2018). In doing so, the city enhances individual empowerment and social inclusion, economic development and cultural prosperity, and sustainable development. It is believed that when the learning city is achieved, there will be maximum development in the society, artisans would be able to function effectively and everyone would be able to contribute meaningfully into the development of the society.

Learning cities can benefit greatly from sharing ideas with other cities at all developmental stages. The Network supports the achievement of all seventeen Sustainable Development Goals (SDGs), in particular SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all and SDG 11 - Make cities and human settlements inclusive, safe, resilient and sustainable (Borkowska & Osborne, 2018). Furthermore, Borkowska and Osborne (2018) stated that the UNESCO GNLC supports and improves the practice of lifelong learning in the world's cities by promoting policy dialogue and peer learning among member cities; forging links; fostering partnerships; providing capacity development; and developing instruments to encourage and recognize progress made in building learning cities. While national governments are largely responsible for creating strategies for building learning societies, lasting change requires commitment at the local level. A learning society must be built province by province, city by city, and community by community.

To achieve a learning city, adult education could serve as a tool for gathering adults from various backgrounds as the respondents. Adult education changes the social and psychological minds of adults more than any other profession, it instills lost hope in them and liberates them from the shackles of ignorance, it also builds their esteem, and self-liberation. Adult education awakens adult learners to become aware of their environmental (social, economic, cultural and political) and psychological potentials as well as hidden abilities; It also exerts enormous influence on the larger society in terms of national development. Adult education continues from where the teacher in the formal school system who rigorously inculcates in the individual the desire for knowledge, understanding and education stops. Adult education is one of the fields of academic endeavour that is saddled with the responsibility of solving socioeconomic, cultural, political and environmental problems. There is positive association between adult education programmes and increased levels of self-esteem and high levels of knowledge and skills which thereby encourage positive and active engagement of people in their own development (Hussain, 2013).

Adult education

The term adult education is nebulous. That is, it is broad and open to different definitions. Adult education just like other fields in social sciences, humanity and management is a vague term which many scholars and institutions have attempted to define in their own ways.

Adult education was defined by UNESCO (1976) as the entire body of organizational process, whatever content, level and method where formal or otherwise, whether they

prolong or replace initial education in schools, colleges and universities as well as apprenticeship, whereby persons regarded as adult by the society which they belong develop their abilities, enrich their knowledge, improve their technical or professional qualifications or turn them in a new direction and bring about change on their attitude or behavior in two fold perspective of full personal development and participation in balance and independent social, economic and cultural development (Jarvis & Wilson, 2004).

Nzeneri (2002) defined adult education as any education given to adult based on the social, economic, political, and cultural needs to enable them adjust fully to change and challenges in their lives and communities. It is important to note that adult education is an agent of social change. That is, it is the kind of education given to adults to enhance community development and in the modern society, there is need for adult education programmes to adopt technological innovation so that adults can keep up with trends.

Furthermore, Bakare (2013) opined that adult education is meant to serve the individual in a variety of ways. She further stated that adult education could help to remedy deficiencies in their formal education, in developing themselves vocationally, health-wise, and even for leisure. There are so many programmes imbedded in adult education e.g., literacy education, workers education, vocational education, labour education, leisure education, pre-retirement education, mass education, remedial and continuing education, etc. All these programmes and so many others not listed are infused into adult education to achieve lifelong education. Adult education is more than mere education for illiterates adults, it is necessary for a wider intellectual, political, civil, and cultural growth.

Adult education is a force for change which by all intents and purposes can help conscientize and mobilize the society in determining its ends by bringing into focus a maximum or re-orientation and adjustment of the value system, attitude and behaviour to any new and changed situation within a limited period of time. This change may be from within or outside any given society. However, it is expected to impart the new skills and techniques required to sustain the innovation (Obashoro, 2017).

Bakare (2013, p. 22) listed the following as the purpose of adult education to every nation:

- “to develop a critical understanding of major contemporary problems and social change;
- to develop the attitude of acquiring new knowledge, qualifications, attitudes or forms of behaviour;
- ensuring the individual's consciousness and effective incorporation into the world of work;
- promoting increased awareness of the relationship between people and their physical and cultural environment, and
- creating an understanding of and respect for the diversity of custom and cultures.”

Technological innovation and adult education

The use of technology in adult education allows the adult learner to learn at his/her own convenience. Learning has become very flexible with the emergence of technology, people can learn in their own space and at their pace. For example, the Covid-19 pandemic

period in the year 2020 had almost all the nations across the world at their wits end but with technology, they were able to avert what would have become an eternal crises. Experts, while comparing the Covid-19 pandemic with the 1918 Influenza pandemic, stated that the methods and swiftness in fighting against the Covid-19 was tenacious than the former; and this is all thanks to technological innovations (Krueger, 2021). Furthermore, learning was not affected because while there was a sit-at-home order globally, E-learning became the order of the day. Learning continued through various technological innovations like zoom, Youtube, etc. Also, in face-to-face learning, the use of whiteboard, computers, audio-vision instructional materials are all part of technological innovations.

Technology in adult education also affects the conduct of adult educators (facilitators) who need to upgrade to a new frontier of teaching practice and become more acquainted with the importance of of digital technology not only as tools, but its effects in adult education opportunities. The facilitators must develop and use innovative strategies to promote quality teaching/learning and create conducive atmosphere for the learners by capitalizing on digital technology. This is however manifested through their instructional designs and delivery mode. The digital age adult educator must be vast in techniques. H/she must shift from being a teacher to being an enabler or facilitator of adult learning through the use of technology. Therefore, such person must be adequately trained in the use of modern technological tools that can enhance the classroom experience and encourage the learner to be more autonomous.

The adult educator must first have access to the technology; this, unfortunately, is still a challenge in most developing countries like Nigeria and Mexico. The educator must be familiar with the various technologies available, and how to apply them under different circumstances to disseminate learning, especially online. "In order to maximise the use of technology, adult educators must be able to answer the pertinent questions about which knowledge is most important for the adult learner, as well as the best way to transmit and display this knowledge for better understanding and learning" (Bakare, 2013, p. 196)

It is no doubt that technology presently plays a vital role in communication, especially in adult education. Technology has made communication methods easier and more varied. In adult education, equipment-oriented instructional techniques have become very useful to adults in terms of helping them to harness the appeal of the senses, as well as learn more conveniently in terms of distance and correspondence education (Bakare, 2013). Technological innovation now pervades all of adult education. It helps to comply with andragogical principles and enriching adult education practice.

Similarities and differences between Huetjozingo, Mexico and Lagos, Nigeria

Lagos State Lagos is the largest city in Nigeria and the most populous city in Africa, with a population of 14.8 million as of 2015 within the city proper (Ayorinde, et. al., 2015). The Lagos metropolitan area has a total population of roughly 23.5 million as of 2018, making it the largest metropolitan area in Africa (Ayorinde, et. al., 2015). Lagos is a major African financial centre and is the economic hub of Lagos State and Nigeria at large. The megacity has the fourth-highest GDP in Africa and houses one of the largest and busiest seaports on

the continent (Idowu, et al., 2011). The Lagos metropolitan area is a major educational and cultural centre in Sub Saharan Africa. The Lagos State Government operates state schools. The education system is the 6-3-3-4 system, which is practised throughout the country (as well as by many other members of the Economic Community of West African States). The levels are Primary, Junior Secondary School (JSS), Senior Secondary School (SSS) and university.

Huejotzingo Puebla is a small city and municipality located just northwest of the city of Puebla, in central Mexico. The city with about 90,000 population is popularly known for their carnival which is described as spectacular and unlike any other carnival in Mexico or in the world (Kath, 2014). The municipality is considered to have a low level of economic marginalization, with about one third of its community considered to have a high or somewhat high level. The major economic activity in Huejotzingo is agriculture, followed by industry. Agriculture, forestry and fishing employ about 39% of the municipality's population (Jiménez, et al., 2020).

In October 2021, Huejotzingo was one of the ten recipients of the Learning Cities Award from UNESCO (Kath, 2014). Huejotzingo qualified for the outstanding award by placing lifelong learning at the centre of its development. The city transformed itself from an agricultural community to the industrial heart of the Mexican sate of Puebla.This was easy to achieve through a comprehensive learning strategy strengthened by equity and inclusion prioritization, sustainable development and entrepreneurship, and implementation of various learning projects over the years. These learning projects have helped reduced illiteracy by 50%, expanding access to the internet and new technologies (Jiménez, et al., 2020).

The infusion of technological innovation and adult education programmes in learning cities aids in tackling the community socio-economic challenges. Technological innovation has been seen as emerging leverage that the community stakeholders adopt while transforming the community from traditional to modern development. Lagos, Nigeria just like Huetjozingo, Mexico has adopted the idea of innovative technology to sustain communities and cities to increase the citizens' standard of living; to attend to difficulties and challenges faced by cities and communities. These challenges create obstacles and make it difficult and nearly impossible to fasten socio-economic development and inhibit improved standard of living of the dwellers as well as cities and communities outlook. Through the introduction of cutting-edge innovation and technology in adult education and lifelong learning, these two learning cities have experienced remarkable development in recent years within their social, economical, and environmental sectors. For instance, these two cities share a common background in agriculture. Just like Huejotzingo, Lagos like other parts of the country was known for agriculture before it became a megacity.

These two cities no longer restrict their sustainability focus and revenue generation to traditional agriculture, rather unlike every other community in their countries; they have introduced innovation and technology which made them become the centre for industrialization and commercialization.

According to the UNESCO Institute for Lifelong Learning report, Huejotzingo supported 1,000 female entrepreneurs in setting up projects, and organized its first ever Festival of

Learning with participation of more than 25% of the city's more than 90,000 inhabitants (Sirolli, 1999). Similarly, the Lagos State Government in 2019, awarded twenty-young innovators and tech firms a total grant of hundred million naira (N100,000,000.00) to pursue various technology-driven innovations across the sic pillars of the development agenda of the present administration (Sirolli, 1999). This grant however is an annual intervention to facilitate and encourage the development of innovative solutions to solve local problems, using cutting-edge technology.

More so, the Escuela Campesina School in Huejotzingo could be likened to the government vocational and technical colleges in Lagos state, where adult learners are exposed to diverse skills and curricula ranging from agricultural courses, creative designing skills, entrepreneurial opportunities, to practical fieldwork where they implement the knowledge gained during their studies into real-life events happening in the community. Also, to achieve inclusive learning for all, these two cities have created an enabling society whereby the public have free access to the internet and new technologies. Through the use of the "smart city programme," there has been an installation of 6,000-kilometre fibre optic cables across the community, schools, institutions, government parastatals, health facilities etc. which has enhanced the high-speed internet access and digital support of infrastructures and technological advancement of the city (Jiménez, et al., 2020).

Nigeria and Mexico have quite a number of similarities in their historical, geographical, and educational aspects. In terms of education, funding often gets short shrift partly because it is hard for politicians to see the political benefits of an investment that won't show dividends in the workforce for years. However, the case is slightly different when it comes to adult education as there are different providers of the programme. In Nigeria, there are various providers of adult education and they classified into two namely, internal and external providers:

Internal Providers: these providers operate within the country. They are locally formed and organised. Examples of internal providers are as follows: -

- Statutory Providers: they are set up by specific laws and whose activities are further backed up by such laws. These providers have core aims of supporting adult education e.g., educational and other ministries, local government councils, National Commission for Mass Literacy and Non formal Education (NMEC), etc.
- Quasi-Statutory Providers: these groups are made up of organizations set up by laws but are not obligated to cater for adult education. However, some of their functions require meeting the education needs of adults. Example of providers in this group are the Universities, Mass media, Industrial Training Fund (ITF), Museums, Library, Centre for Management Development, etc.
- Non-Statutory Providers: this group involves those organizations whose activities are not backed up by law. However, they are often registered with Corporate Affairs Units; they have access to operate within the guidelines of their own descriptions and focus. They operate under various groups such as Non-governmental organizations (NGO), Faith-based organization (FBO), work oriented organization, community-based organizations (CBO), etc. (Obashoro, 2017).

External Providers: these may be described as global, international and regional organizations that concern themselves with the provision of adult education. The followings are examples of external providers of adult education in Nigeria:

- Global Organization: under the global organization, there are the Non-governmental organizations and Inter-governmental organizations. In the non-governmental group, there are those who take adult education as their major concern e.g., ICAE. There is another group within the NGO whom adult education forms a part of their work e.g., IPPF. The Inter-governmental organizations on the other hand, consist of those who sees adult education as an important part of their work e.g., UNESCO; and another set of groups with some interests in adult education e.g., WHO, ILO, etc.
  Apart from the NGOs and IGOs, there are also charitable institutions under the global organization group whose generosity have helped in catering for adult education e.g., Ford Foundation and Friedrich Ebert Foundation.
- Regional Organization: just like the global organization, the regional organization is also divided into Non-governmental organization and Inter-governmental organization. The NGO have those who see adult education as their major concern like the African Adult Education Association (AAEA), and the ones with some interests in adult education like the Association of African Universities (AAU). The Inter-governmental organization on the other hand, consists of organizations like the African Union (AU) and European Union (EU) (Obashoro, 2017).

In Mexico, providers of adult education include: Instituto Nacional Para la Educacion de los Adultos (National Institution of Adult Education), DVV International, Instituto Estatal de Educación para Adultos (State Institute for Adult Education) IEEA International Council of Adult Education (ICAE), etc. (Obashoro, 2017).

Despite the similarities between these two cities, the difference in size could pose a problem in the success and effectiveness of whatever approach may be used in the development of lifelong learning approach. Lagos is seen as an urban megacity with a population of over 15 million, HuejoZingo, on the other hand is a fast-developing rural city with over 90,000 inhabitants. The difference in population between these two learning cities can be considered as the major constraint for Lagos compared to Huejotzingo.

Also, there is a difference in adult education policy between the two learning cities. The Nigerian National Policy on Education which was adopted in 1977 and modified in 1981 provides for equal access to education, including continuing and further education, and commits to the eradication of illiteracy and promotion of lifelong learning. (Obashoro, 2017). That is to say, education at at all stages is a major priority in Nigeria, and this is in tune with the number one agenda of the International Benchmarks on Adult Literacy (Literacy is about acquiring and using reading, writing and numeracy skills, and thereby the development of active citizenship, improved health and livelihoods, and gender equality). "The education of adults and young people is not a priority in Mexico compared to the education of children, and this can be clearly seen in the miserly budget, which over the past decade has never reached 1 % of the total education budget. Literacy in particular

has not been a priority over the past 12 years; it does not figure in the public policy agenda and was not included in the last two government programmes. This just widens the vacuum that other non-government initiatives began to fill." (Hinzen, et al. 2022).

Comparization of technological innovation and adult education in Huejotzingo, Mexico and Lagos, Nigeria

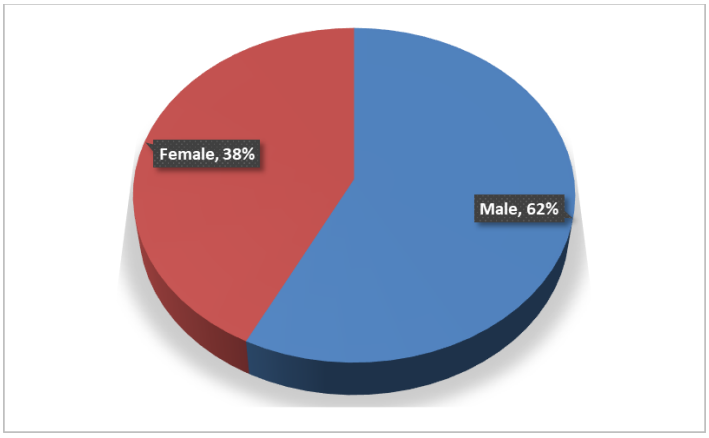
Research methods

The study is meant to compare technological innovation and adult education in two UNESCO's learning cities - Huejotzingo, Mexico and Lagos, Nigeria. Lagos State was chosen because of its cosmopolitan and unique nature. It is unique because it was formally the federal capital of Nigeria, and so all the ethnic groups of Nigeria are adequately represented in Lagos State because it is also the commercial nerve of Nigeria. Somolu Local Government Area is one of the largest local government therefore it would be considered for the study. Somolu local government has a total population of 403,569 with a good population of 221,963 of youth (Ayorinde, et. al., 2015). Convenient sample technique was used to pick a total sample of 150 youth from six different constituent wards out of 11 wards in Lagos Shomolu local Government. These selected youth were chosen because they possess good knowledge of the issue understudy. The items in the questionnaire were analysed with the use of and frequency count and simple percentages.

Demographic data of the respondents

The total number of 150 youths in the Shomolu local government area were selected at random to fill out questionnaires. The participants age ranged from 18 - 45. The questionnaires were administered over a 2-week period in December, 2021.

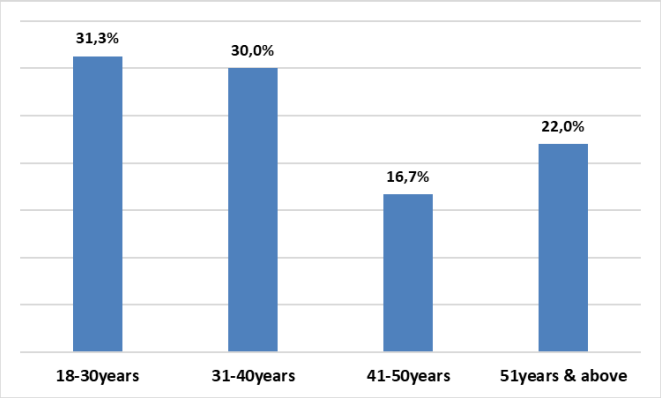
Figure 1: Gender of the respondents (N=150)



Source: own figure, field survey, 2022

The pie chart shows that 38% of the total respondents were females while 62% were males. This implies that majority of the respondents that gave their opinion on technological innovation in learning cities and adult education programmes in Lagos state, Nigeria were males.

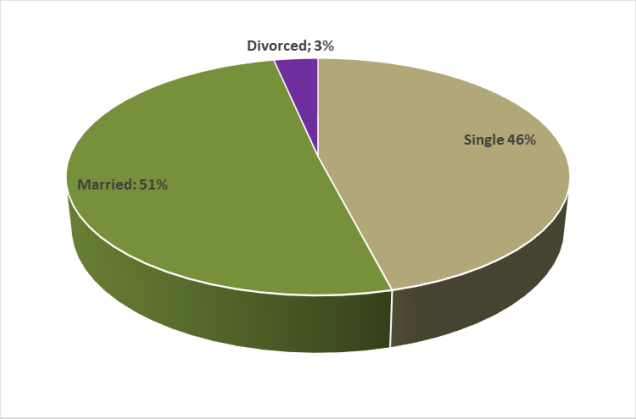
Figure 2: Respondents' age range (N=150)



Source: own figure, field survey, 2022

Figure 2 shows that 31.3% of the total respondents are between 18-30 years of age, 30% are between 31-40 years, 16.7% are between 41-50 years and 22% are 50 years and above.

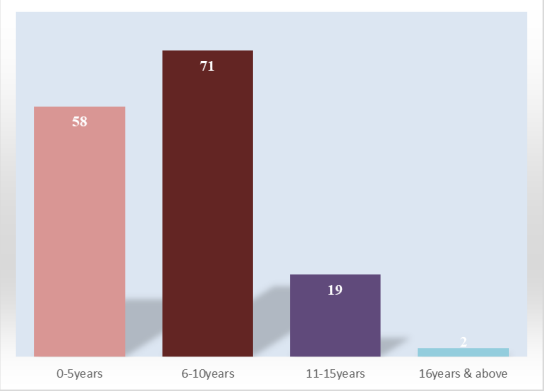
Figure 3: Marital status of the respondents (N=150)



Source: own figure, field survey, 2022

Also, 46% of the total participants are single, 51% are married and 3% are divorced. This indicates that majority of the participants are married.

Figure 4: Years of learning (N=150)



Source: own figure, field survey, 2022

Figure 4 shows that 58 of the total respondents had 0-5 years of learning experience, 71 had 6-10 years, 19 had 11-15 years and 2 had 16 years and above learning experience.

Analysis of research questions

Table 1 shows that 13.3% of the respondents opined that the technological intervention can be achieved by giving all youths the opportunity to have basic education, 20%) opined that the technological intervention should be achieved by dividing learning programme into sections (morning, afternoon and evening), 16.7% of the respondents also opined that the technological intervention could be achieved by organizing learning programs in various centres or areas, 20% opined that the technological innovation can be achieved by allowing people to choose different computer packages. Also 13.3% are of the opinion that technological innovation can be achieved by making learning of computer free and accessible while 16.7% opined that making learning inclusive in all schools can lead to the achievement of technological innovation.

Table 1: How can technological intervention be utilized to achieve lifelong education in Lagos state? (Research Question#1) (N=150)

Response	Number of Respondent	% of respondents
By giving all youths the opportunity to have basic education.	20	13.3
By creating technological innovation hubs in almost all the local government of the state	30	20
By inculcating digital skills in learning programmes in various adult education centers in Lagos state.	25	16.7
By enacting digital transformation policy on learning in the state	30	20
By making computer learning free and accessible for all categories of learners.	20	13.3
By prioritizing inclusive digital literacy in the education sector.	25	16.7
Total	150	100

Source: own table, field survey, 2021

Table 2 shows that 33.3% of the respondents opined that teaching of basic computer would stimulate creativity, 20% suggested that learning of Corel draw could simulate creativity, 16.7% of the respondents also suggested that access to basic laptops or desktop would stimulate creativity in Lagos, 16.7% opined that provision of high internet speed will stimulate creativity in Lagos state while 13.3% are of the opinion that digital literacy would stimulate creativity in Lagos.

Table 2: What form of technological innovations will stimulate creativity in the people of Lagos state? (Research Question#2) (N=150)

Response	Number of Respondent	% of respondents
Teaching of basic computer programs	50	33.3
Teaching of basic Microsoft computer applications	30	20
Exposure to basic computer programming	25	16.7
Exposure to data analysis programming applications	25	16.7
Promotion of digital literacy	20	13.3
Total	150	100

Source: own table, field survey, 2021

Table 3 shows that 33.3% of the respondents opined that improving digital literacy rate among the youths could improve sustainability, 20% suggested that creating free browsing centres would sustain suitability, 16.7% of the respondents also suggested that access to basic laptops or desktop would sustain suitability, 16.7% opined that provision of free internet access will sustain suitability while 13.3% are of the opinion that teaching computers after school would encourage sustainability.

Table 3: How can technological intervention be used to increase sustainability? (Research Question#3) (N=150)

Response	Number of Respondent	% of respondents
By improving digital literacy rate of youth	50	33.3
By creating free browsing centre	30	20
Given equal and free access to computer	25	16.7
By providing free access to internet	25	16.7
By encouraging schools to teach computer after school hour	20	13.3
Total	150	100

Source: own table, field survey, 2021

Table 4 shows that 33.3% of the respondents opined that the importance of the community participation is planning, 20% suggested that funding is one of the importance of community involvement, 16.7% of the respondents also suggested that Evaluation is the aim of community participation, 16.7% opined that program management is the importance of community involvement while 13.3% are of the opinion that program monitoring is the importance of community participation.

Table 4: What is the importance of community involvement and participation in the achievement of learning cities? (Research Question#4) (N=150)

Response	Number of Respondent	% of respondents
It enhances the cultivation of change enablers in the society	50	33.3
It encourages warm and friendly acceptance of developmental changes in the community	30	20
It encourages community members to take ownership of developmental projects in the society.	25	16.7
It will promote effective planning and execution of self-help project execution in the society.	25	16.7
It encourages harmonious and collective working relationships among community members towards achieving smart learning cities.	20	13.3
Total	150	100

Source: own table, field survey, 2021

Discussion of findings

Findings from research question one shows that in order to achieve technological innovation in Lagos state, the youths should be given the opportunity to have basic education; learning programmes should be divided into sections (morning, afternoon and evening); learning programmes should be organised at various centers; people should be allowed to choose from different computer packages; learning of computer should be made free and accessible, and inclusive learning should be introduced in the education sector. This is in tandem with what was done in Huetjozingo, Mexico which led to being a beneficiary of the UNESCO learning cities award life (Borkowska & Osborne, 2018). This is also corroborated by UNESCO which defined learning cities as a city that effectively mobilizes its resources in every sector to promote inclusive learning from basic to higher education; revitalizes learning in families and communities; facilitates learning for and in the workplace, extends the use of modern technologies; enhances quality and excellence in learning and fosters a culture of learning throughout life.

Findings from research question two portrayed teaching of basic computer program, learning of Corel draw, access to basic computers, provision of high internet speed, and digital literacy. These forms of technological innovation have been used in developed nations like the United Kingdom (UK) and Italy. They have also been tested in developing cities (Huetjozingo, Mexico) which yielded positively by earning them an award of recognition from UNESCO. If they can be invested in and made use of accurately, the feat of learning cities would be achieved in Lagos, Nigeria especially through adult education programmes. Kolb (2013) also corroborated the study with the suggestion that the infusion of technological innovation and adult education programmes in learning cities aids in tackling the community socio-economic challenges.

Findings from research question three reads improving digital literacy rate among the youth, creating free browsing centres, equal and free access to computer, provision of free access to the internet, encouraging schools to teach computer studies after school hours can be used to achieve sustainability. All these have been used in the developed cities and they yielded positively. Countries like Mexico and Italy have also tried it and it worked for them. The finding is also corroborated by Osborne and Hernandez, (2021) who opined that developing friendly application learning tools that can stimulate retention of learning and as well as transform the learning patterns of participants would ensure application of knowledge for building smart cities.

Findings from research question four shows that community participation involves planning. Without proper planning, all efforts will go to waste. Also, there is need for adequate funding and evaluation. The evaluation process could be formative or summative.

Conclusion

The role of adult education in development is not limited only to economic and social spheres. It is muti-dimensional. There is a strong link between adult learning and democracy. This is so because, as acknowledged at the UNESCO Fifth International Conference on Adult Education held in Hamburg in 1997, "substantive democracy and a culture of peace are not given; they need to be constructed "(UNESCO, 1997)

Adult education, when properly funded will fill the gap between the rich and the poor. With the infusion of technology into adult education programmes, there will be smooth integration of economies in the global world. Adult education is instrumental in familiarizing the active population of Nigeria with Information Communication Technology (ICT), a decisive tool for the smooth integration of Nigerian economies in the global economy. The importance of this cannot be over-emphasised as the world is rapidly moving towards knowledge-based economic structures and information societies that comprise networks of individuals, firms, and countries linked electronically in inter-dependent and interactive relationships. Adult education also plays a major role in social development. It is now widely admitted that growth will not reduce poverty unless poor people are able to actively participate in it. Such participation can become effective to a large extent through adult education.

It is recommended that adult education curriculum be reviewed to accommodate ICT learning to help train adults in skills that will stimulate their creativity and make them innovative in all areas of their lives to increase sustainability. Hence, a similar model which was used in Huejotzingo (Mexico) can also be used perfectly in Lagos (Nigeria) to stimulate life-long learning. Also, there is need to invest in the quality of adult learning provision. Segregation should be shunned and quality education should be made accessible to all.

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Appendix 1: Technological Innovation in Learning Cities and Adult Education Programmes: A Comparative Analysis between Mexico and Nigeria, questionnaire, 2021

Dear Respondents,

My name is Ndidiamaka Annie Ogbonnaya, a Master's student of Manpower Training and Development at the University of Lagos' School of Postgraduate Studies.

This questionnaire is designed to obtain information on Technological Innovation in Learning Cities and Adult Education Programmes in Nigeria.

You are requested to kindly complete the questions as honest as possible.

Please be assured that your response will be used strictly for the purpose of this study and would be handled with utmost confidentiality.
Best regards,
Ndidiamaka Annie Ogbonnaya.

SECTION A: DEMOGRAPHIC DATA
Instruction: kindly tick (√) the appropriate response.
Gender: Male [ ] Female [ ]
Age of respondents: 18-30 yrs[ ] 31-40 yrs [ ] 41-50 yrs [ ]
50 years and above [ ]
Years of learning: 0-5 years [ ] 6-10 years [ ] 11-15 years [ ] 16+ years [ ]
Marital status: Single [ ] Married [ ] Divorced [ ]

SECTION B

Instruction: Kindly tick (√) your level of agreement with regards to the statements below. (Choose one option only)

Key: Strongly Agree (SA), Agree (A) Disagree (D), Strongly Disagree (SD).

S/N	ITEMS	SA	A	D	SD
	How can Technological Innovation be utilized to achieve Lifelong Education in Lagos, Nigeria?				
1.	By giving all youths the opportunity to have basic education.				
2	By creating technological innovation hubs in almost all the local government of the state				
3	By inculcating digital skills in learning programmes in various adult education centers in Lagos state.				
4	By enacting digital transformation policy on learning in the state				
5	By making computer learning free and accessible for all categories of learners.				
6	By prioritizing inclusive digital literacy in the education sector.				
	What form of Technological Innovation will stimulate creativity in the people of Lagos State?				
7	Teaching of basic computer programs				
8	Teaching of basic Microsoft computer applications				
9	Exposure to basic computer programming				
10	Exposure to data analysis programming applications				
10	Promotion of digital literacy				
	How can Technological Innovation be used to enhance sustainability of learning in adult education programmes?				
12	By developing friendly application learning tools that can stimulate retention of learning				
13	By creating innovation hubs for cross-fertilization of ideas				
14	Promotion of eco-friendly application tools for self-pace learning				
15	Encouraging the use of technological artificial intelligence to determine learning preference of adult learners.				
16	By transforming adult learning activities into educational mobile application tools				
	What is the importance of community involvement and participation in the achievement of Learning Cities?				
17	It enhances the cultivation of change enablers in the society				
18	It encourages warm and friendly acceptance of developmental changes in the community				
19	It encourages community members to take ownership of developmental projects in the society.				
20	It will promote effective planning and execution of self-help project execution in the society				
21	It encourages harmonious and collective working relationships among community members towards achieving smart learning cities.				

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Bertalan Péter Farkas – Kristóf Áron Györgyi- Ambró

SUPPORTING THE TEACHERS' COMMUNITIES WITH INNOVATIVE INITIATIONS – THE FUTURE OF LEARNING CONCEPT

Abstract
The concept of the Future of Learning Initiative (FLI) is about supporting everyday pedagogical practice with digital tools and collaborative learning for teachers. In this space, teachers collaborate with other teachers, learn from one another and reflect on their own practices together, and for this process, our organisation provides a thoroughly planned collaborative environment, methodology and know-how. We, at the Tempus Public Foundation (TPF) believe that pedagogy will become even more effective not by digital tools but by educators' thinking, the key to change is always the educators themselves and this is confirmed by all major international research as well as policy recommendations (EU, OECD, etc.). Approaching the FLI that has online services, we can say that the open online courses and online services have brought both the democratisation of adult education and the expansion of knowledge sharing opportunities. In addition to the many criticism of the open online content, it can certainly be said that online courses such as The Future of Learning MOOC have made a significant and remarkable contribution to the democratisation of adult education by sharing achievable learning outcomes with the wider public, with the key element of accessibility. With the Future of Learning Initiative, we have been able to raise knowledge management principles as well as practices that have been accumulated for more than a decade to a European level, and also set the goal of further internationalising the Future of Learning Initiative. In this summarising article we are going to introduce the FLI initiative and the FLI MOOC to the audience with details of the MOOC, the concept and methodology. The results of the different questionnaires, the theoretical background, and the measurements of the efficiency of the different tasks and assignments will be published in several different articles in the upcoming months and years.

Kulcsszavak: Future of Learning concept; Tempus Public Foundation; teachers' communities of practice

Introduction to the Future of Learning concept

The concept of the Future of Learning Initiative (FLI) is about supporting everyday pedagogical practice with digital tools and collaborative learning for teachers. In this space, teachers collaborate with other teachers, learn from one another and reflect on their own practices together, and for this process, our organisation provides a thoroughly planned collaborative environment, methodology and know-how (Farkas & Györgyi-Ambró, 2021). We, at the Tempus Public Foundation (TPF) believe that pedagogy will become even more effective not by digital tools but by educators' thinking, the key to change is

always the educators themselves and this is confirmed by all major international research as well as policy recommendations (EU, OECD, etc.).

Figure 1. The Future of Learning logos

Source: Tempus Public Foundation, n.d., figure designed as internal documentation

The Future of Learning Initiative is complex but has services to reach its target groups and make knowledge more manageable and transferable which are

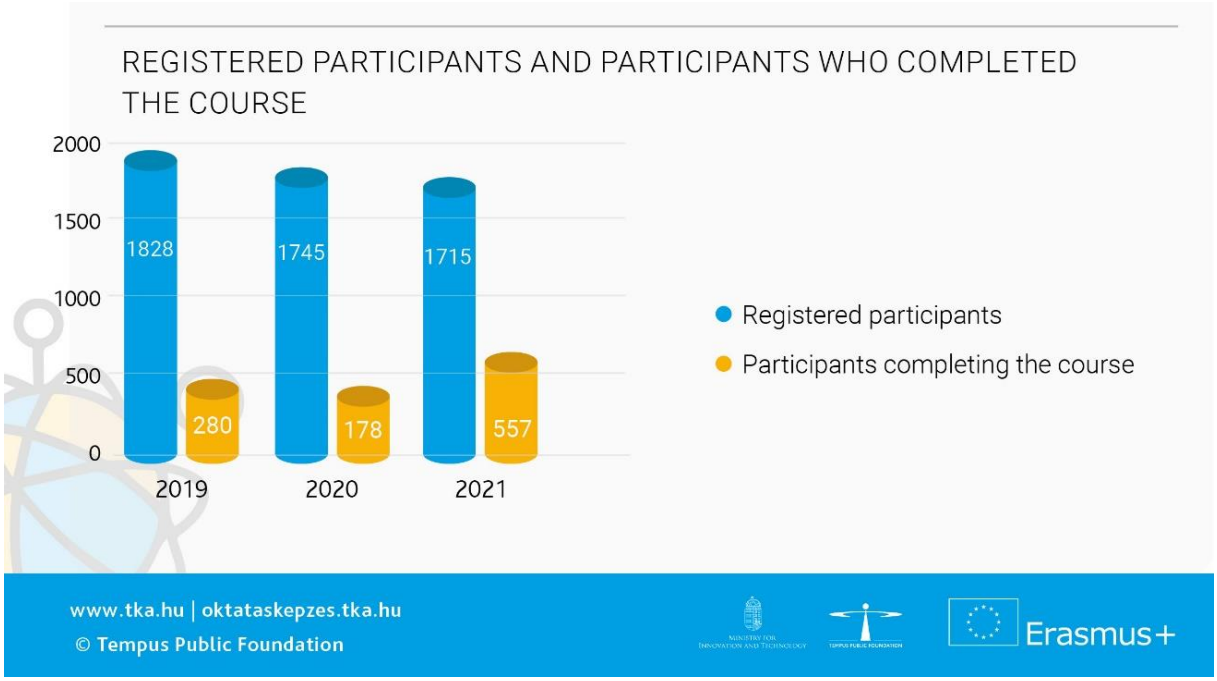
- The Future of Learning MOOC
- The Digital Methodology Repository
- The Future of Learning YouTube channel and Facebook page

The concept of FLI was created in 2018 but parts of the FLI had been launched earlier. Managing the largest collection of Digital Methodology Repository in the country (with over 500 tested, excellent pedagogical ideas with expert evaluations) as well as the comprehensive Digital Space Initiative, and trainings and projects of the TPF for other educators, we have wide access to thousands of teachers in the country.

The Digital Methodology Repository (launched in 2012) has an annual call that receives around 50-60 applications of teachers to share their own pedagogical-methodological ideas and curricula with one another (totally free of charge). The Repository provides teachers with free access to peer-reviewed content that they can integrate into their own pedagogical practice. The Repository and the annual call for enriching the content show very clearly what teachers know and what they need to know on a particular subject, also, the online platform that we use provides them with opportunities to connect through social features such as: rating methodological ideas, creating collections and sharing best effective practices with one another. The Repository serves as a bank of specific knowledge, filled with various classroom tools and techniques. (Farkas & Györgyi-Ambró, 2022).

Exploiting our networking opportunities, we have created The Future of Learning MOOC, which has become the largest massive open online course for teachers in the Carpathian Basin, with 1,500-2,000 participants per year and have reached teachers and educators in over 20 countries. Anyone can sign up for the Future of Learning MOOC free-of-charge and receive a certificate upon completion of the course (Farkas & Györgyi-Ambró, 2021).

Figure 2. Data from the FLI MOOC course (2021)



Source: Farkas & Györgyi-Ambró, 2021, p. 25

The content of each Future of Learning MOOC course is developed according to the results of a preliminary needs assessment in each year. We select the most current topics based on the survey results as well as we take into account values and key messages of our organisation, at the same time, we constantly looking at the domestic and international educational trends.

Currently, The Future of Learning MOOC has been organised for the fourth time in 2022 but we have only summarised data from the earlier years – it means that databases which are shown in this article was closed at the end of 2021. The three MOOCs – in 2019, 2020 and 2021 – have had an impressive 98-99% average student satisfaction rating. In addition to the primary target group of school teachers, almost 20% of our participants have arrived from a wider group: higher education lecturers, teacher trainers and trainees, kindergarten teachers, special education teachers, and representatives of various universities as well as of the policy-making sphere.

It is very important not only to us but also to our participants that we involve people from various institutions with diverse experience: discussing topics of common interest from different angles results in consequences and opens up approaches that would have stayed hidden without heterogeneity. This means that the Future of Learning Initiative supports a community of practice to be designed and created. Community of practice (CoP) is a group of people who share a common interest and work together over an extended period of time and explore methods of working in a specific area of knowledge (Farkas & Györgyi-Ambró, 2022). The Future of Learning MOOC and other instruments of the FLI successfully apply the knowledge management technique of CoP to create, sustain and help thrive a learning community with

- supporting deep cooperation between participants;
- incorporating community-building features and encouraging their use;
- developing and encouraging joint and reciprocal activities;
- conscious scaling of individual learning and individual learning outcomes to the community level;
- supporting a collaborative facilitator team based on common principles and guidelines for participants;
- involving community organizers and other facilitators and encouraging participants to develop cross-sectoral partnerships;
- supporting and encouraging dialogue and debate in professional forums;
- raising awareness of and encouraging peer learning.

The know-how and knowledge management experience accumulated in the Initiative have helped us support Hungarian-speaking teachers from other countries: in 2020, we implemented a large-scale in-service online training for nearly 1,000 Hungarian teachers in Romania within the Initiative.

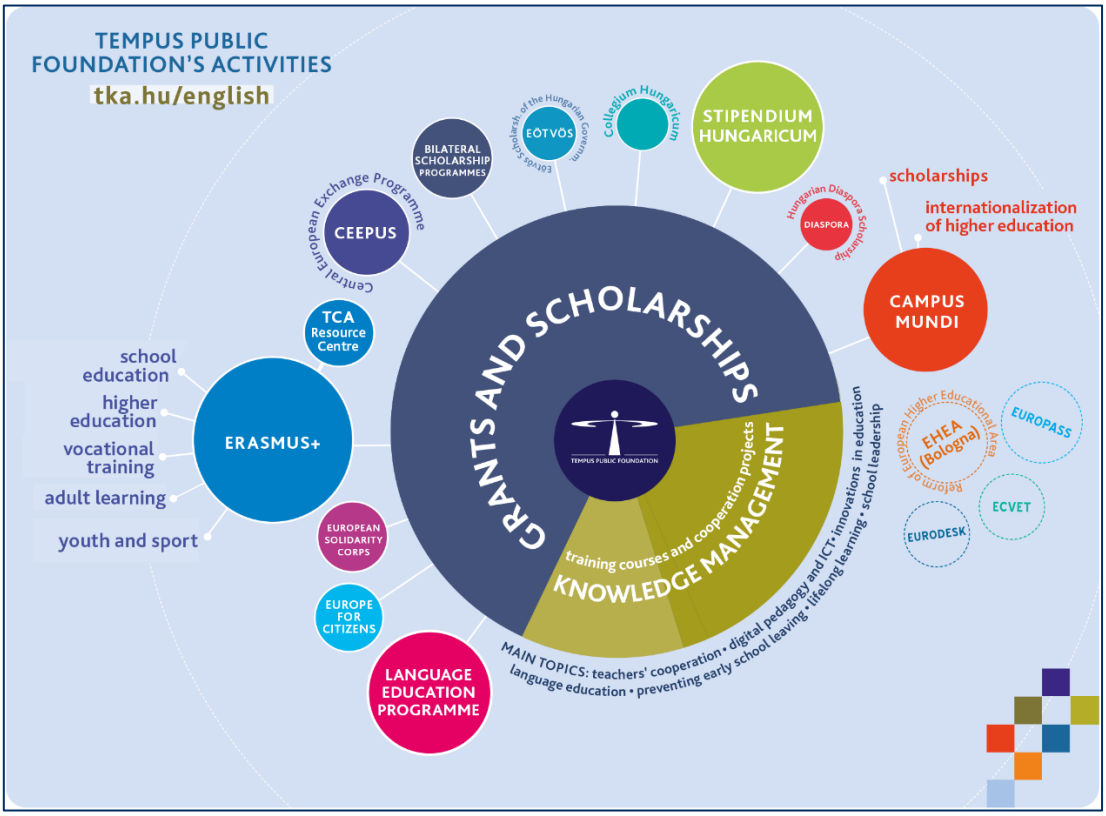
Thus, the number of people reached in the Future of Learning Initiative altogether has already exceeded 6,000 solely with the courses. Adding all YouTube subscribers, viewers, registered teachers of the Digital Methodology Repository, we exceed over 100,000 people inside and outside the country.

The Future of Learning YouTube channel (A tanulás jövője - Tempus Közalapítvány, n.d.) became a key regarding the Initiative over the past year, exactly because of the unfortunate situation caused by the pandemic. Consequently, we have become able to come to the aid of thousands, or even tens of thousands of educators facing difficulties caused by the pandemic, helping them connect with their students and cooperate in a constructive, innovative way to use the advantages, opportunities and benefits of digital education. The Future of Learning Facebook page (A tanulás jövője, n.d.) is also very well-known and active, filled with valuable content relevant to the target groups: images, videos, calls, etc.

Background and motivation

The Future of Learning Initiative is an initiative of the Tempus Public Foundation, Hungary. The Tempus Public Foundation (TPF) is a non-profit organisation established in 1996 by the Hungarian Government, with the task of managing international cooperation programmes and projects in the field of education, training and EU-related issues. Today it is a background institution of the Ministry of Culture and Technology and has approximately two hundred and seventy employees (Tempus Public Foundation, n.d.).

Figure 3. Tempus Public Foundation (TPF) organisational chart



Source: Tempus Public Foundation, n.d., figure designed as internal documentation

Over the past 25 years, the TPF has gathered wide experience in development, coordination and execution of different trainings and courses. Based on these, the TPF has a distinctive know-how in this field, including the execution of massive open online courses, unique to Hungary and the Carpathian Basin. The training courses developed by the Knowledge Centre offer a European insight, practical knowledge, professional connections and mental recharge for government associates, representatives of small- and middle-sized enterprises and teachers. Throughout the years, our offline, online and blended courses gained more than 30,000 satisfied customers in the last 20 years.

Main challenges and how to respond

As the literature says: three major categories of findings were identified: issues related to online learners, instructors, and content development (Kebritchi, 2017). In the next chapter we are describing these in our case and based on our experiences. The Future of Learning Initiative has been privileged in many ways: its current format has been shaped by careful hands of many excellent and enthusiastic professionals involved and its sustainability is ongoing thanks to governmental support, although, initially, it was a serious issue.

Challenges on the level of the entire initiative

Actually, its initial professional challenge was twofold: 1. we noticed that faith and trust in digital education did not strengthen in direct proportion to technological changes, and

2. we also identified the need for facilitating the strengthening of collaborative learning among teachers. 3. The digital space in which teachers, too, have found themselves is excessively noisy: there are thousands of digital teaching materials, resources and opportunities and – depending on the level of digital literacy – some teachers perceive this phenomenon as pressure from the outside (from society, economy and policy). Later, from 2020 onwards, the implementation of the initiative has been compromised and forced to follow an inescapable path determined by the COVID-19 pandemic, which – at the same time – fostered further development of the FLI in many ways.

To meet the challenges, we have designed an iterative planning process with our target groups and participants. It is manageable because of the contact through social media and e-mail channels. At the milestones, they were asked to fill questionnaires, participate in knowledge cafés, discussions to set up e.g. the focus topic of the annual call of the Repository every year, identifying the three or four current pedagogical topics implemented in the Future of Learning MOOC. Also, we are following the findings coming from the latest research, current issues in pedagogy, methodology and didactics and building relations with the biggest teacher training university in Hungary (ELTE Faculty of Pedagogy and Psychology). It is clear that our target groups need to turn down the "noise", focus on important issues and get access to effective best practices (mostly but not only from the Digital Methodology Repository) as well as webinars and knowledge-sharing occasions on specific topics. Clear and simple work methods, just like the iterative process are examples of the most valued and appreciated parts of the initiative based on the feedbacks of the participants (Farkas & Györgyi-Ambró, 2021).

Challenges on the level of the FLI MOOCs

One of the biggest difficulties with trainings is the prevention of dropouts typical of free online training. One of our tools to address this is online community building, which can have serious retaining power. Another tool is differentiated curriculum and accountability, which helps to make participants from a very wide range of education feel that the task at hand is relevant to them. We can be justifiably proud of the participants of the Bolyai Summer Academy and the Autumn Mini-Courses, who completed the tasks in an extremely high proportion and took a very active part in the community activities of the course (Györgyi-Ambró, 2020).

The other difficulty is keeping in touch with the participants. The source of the problem here is that we only see as much of the participant as they want to see of themselves, as is usually the case in online spaces. This is why in the introduction to our courses we will ask if you will report your problems and contact the organizers if you have a problem, and whether you will communicate with other participants on our forums and other interfaces. Awareness of active communication is very important to give participants an experience of online learning and feedback is extremely helpful in furthering our training.

Communication and liaison between participants has improved dramatically since the introduction of distance learning in the spring, and we see a need for our participants to make up for some of the lost personal contacts and contacts in the online space. We look forward to helping you with our online courses.

Main values and core ideas of the initiative

From teachers to teachers

Based on preliminary needs assessments at the Public Foundation, feedback on the course, the contents of the Digital Methodology Repository, in consultation with experts and examining the pedagogical literature, they plan year by year what kind of content and topics should be included in the course. As needs assessments are carried out with practicing educators and then the curriculum itself is built by practicing educators, this guarantees that the participants will gain practical, up-to-date and useful knowledge, but the course content is we also often involve external researchers in the work (Györgyi-Ambró, 2020).

Innovation

In addition to the quality expectations related to the curriculum, in order to maintain the interest in the course and the professional quality, we have to come up with innovations every year. The focus of innovation is on strengthening knowledge sharing and collaboration between teachers in the online space. Year after year, based on feedback from facilitators, experts and participants, the online training is being further developed – we have gained experience in involving community organizers, satellite learning trips in addition to the main learning pathways and experienced the effects of the epidemic, and tried to mitigate the impact on schools of COVID-19 crisis immediately within a few days. One such innovation was the Digital Methodology Incubator, in which participants can seek advice and suggestions for developing their ideas. In this way, they can provide valuable experience not only for teachers but also for teacher education and in-service teacher training institutions (Györgyi-Ambró, 2020).

Collaboration between stakeholders

Collaboration will be very important in the course and in the initiative as a whole, including collaboration between facilitators and collaboration between participants and organizers, and the closest possible collaboration between participants. The Tempus Public Foundation also works with teacher training institutions to provide the most innovative content and services possible year after year. In 2021, the "I'll be a teacher!" professional workshop members – who are students in initial teacher-training – were asked to organize the community and organize the knowledge and ideas published in the course using a mind map. Facilitators also cooperate in the planning and implementation of the course, in addition to their own modules, in the development of the course as a whole, and in 2021 the individual modules were already prepared by pairs of teachers (Györgyi-Ambró, 2021).

Collaborative teacher learning

Various labels are used to describe ways in which teachers work with others to develop their professional learning – for example, specialist, collaborative or peer coaching, collaborative enquiry, and joint practice development (Cordingley 2013). Collaborative

teacher learning is conceptualised in our project as teachers working together through purposeful processes of interaction intended to advance teachers' learning. Working together can extend beyond teachers to collaborating with students, support staff, community members and other educational stakeholders. Collaborative teacher learning is further defined for us by incorporating an explicit values-stance that makes clear that worthwhile collaboration involves participative and inclusive values and a commitment to expansive rather than test-led or performative conceptions of learning. The values-stance integrated into this conceptualisation is explained further in the next section (Györgyi-Ambró, 2020).

Collaborative teacher learning overlaps with the notion of teacher leadership where teachers are active agents of change working with others as the initiators and enactors of innovation (Woods & Roberts, 2018). Teachers in this conception of collaborative working are not simply passive recipients and transmitters of local, regional and national educational policy, but active interpreters and shapers at school level of policy (Ward et al., 2015). The learning generated by collaborative teacher learning may enhance individual learning and generate emergent learning in the form of joint products and new knowledge emergent from the group, network or organisation. Hence, collaborative teacher learning does not imply the absence of individual self-activity and learning. It is distinct from what we term individual focused teacher learning – by which we mean action by an individual teacher that is solely to advance that teacher's learning and does not involve purposeful working with one or more others to this end (Albrecht-Garai et al., 2018).

Motivational elements in the initiative and the FLI MOOC

We have been concerned a lot about how we can most effectively help knowledge transfer between educators. During the development of our programs and projects, we have several questions about this (Györgyi-Ambró, 2020).

What makes an educator try a digital device in his or her classroom practice?

We can see the personal recommendation and inspiration as real keys. At the first meeting, teachers typically start using digital tools to motivate students. Loss of motivation for students is a global problem and it seems obvious to use tools that are already very widely available: computers, mobile phones. But that brings us to another question: Is something in itself motivating because it's digital? The answer, of course, is no. An improperly designed lesson organized with ICT tools can even lead to an additional loss of motivation for students (Györgyi-Ambró, 2020).

Partly because of the above, and partly based on the experiences we have shared in our courses, we see the role of the board of educators or the community of educators in having a huge initial experience. Positive feedback from students is one of the biggest motivating forces for educators. However, in order for our first experiments and acquaintance with the digital space to be followed by successful classroom exercises, the support of the teaching community seems to be an almost unavoidable element. Suggestions and feedback from fellow educators can significantly shorten the learning process, increase effectiveness, and help eliminate mistakes and problems. That's why we created our courses

in the form of creating an online teacher community as an emphasis of the courses. Participants in our courses are always advised to look for fellow students to complete the courses with whom they can discuss what they have learned and plan the steps for practical use. Anyone who has no acquaintance from our own teaching community in our course can surely find a partner in the forums and other interfaces designated for this purpose (Györgyi-Ambró, 2020).

By teaching an educator how to use a particular tool, what guarantee is there that he or she will incorporate it into his or her classroom practice?

On the one hand, there is a time factor in this question that is critical for most educators. How much time can I devote to preparing a lesson or task? Does the time invested pay off? For example, the Digital Methodology, where you can search for content you've already shared by topic and age group, wants to help. The Future of Learning courses, it is important to share the finished products after the assignments with each other, as these are not only inspiring, but could be reused to save teachers a significant amount of time preparing for lessons. The basic condition for this, however, is to publish our ideas thoroughly and easily adaptable (this has always played a key role in evaluating the award-winning ideas of the Digital Methodology). Furthermore, many educators find that they are reluctant to use digital tools. This may be due to the fact that even beginners use digital tools, or the fact that their students have a much better understanding of technology, so that their own role as a knowledge carrier is questioned. The question arises for many as to whether we are able to ask students for help. We see that for educators who have a very good answer to this question, the initial stage in incorporating digital tools is much easier. It is also unavoidable to use students 'opinions and feedback to create truly motivating, quality digital content. They also partly coincide with certain elements of the paradigm shift so much mentioned by education researchers, in which the role of educators of the future should be less and less a role in supporting knowledge (Györgyi-Ambró, 2020).

What is the role of sharing experiences and best practices in this learning process?

It may be important to specify the topic and age here, but within a larger community of teachers (which the online space is great for, among other things, searchability and reviewability), a wealth of valuable knowledge can be accumulated in a very short time. Achieving a goal or choosing a tool would often require many, many hours of research, which can be revealed in a well-functioning, supportive teaching community by simply asking questions in a dedicated forum. We think that it would be extremely difficult to ask a question to which one of the more than a hundred thousand Hungarian-speaking teachers and educational professionals would not have found at least a satisfactory but rather outstanding answer. Again, this can save teachers time, as choosing the wrong tool can make hours and days of work unnecessary and a guarantee of professional quality. In the case of digital devices, this process of knowledge sharing is repeated more often than similar content, as the devices that can be used and the user habits around us are also changing rapidly. We need to continually update our toolkit and update our educational content to stay up to date (Györgyi-Ambró, 2020).

How wide can training be organized in a given online environment? (ages, subjects, level of digital competence) What are the advantages and disadvantages of teaching teachers with different digital competences together?

Answering this question seemed to be one of the most difficult, and each course implemented adds valuable new perspectives and experiences to this issue. We know that sharing experiences in different areas of knowledge very often brings value to other areas as well. However, too much information can result in a daunting and difficult-to-process learning environment that can make it difficult to process topics. We try to find an optimal ratio in this duality, where the general community can find common ground along the more general goals (e.g. by what means can I achieve effective online collaboration?) Or in a narrower circle – for example in subject forums or course groups – talk about more specific situations (e.g. well-proven online platforms for teaching mathematics). Hopefully, these collaborations and common learning opportunities are of value to everyone. Based on the interviews with our facilitators, the picture shows that they themselves acquire a lot of new knowledge in the educational process and this is probably also true among the more experienced participants in the use of ICT, who know questions not only with each other but also with prominent actors, to discuss or even initiate cooperation. We cannot show a person who knows every corner of the online learning space, as that would be a complete impossibility, as we are talking about a huge and ever-changing body of knowledge. Therefore, in addition to the content offered by our curriculum developers, participants with advanced ICT knowledge who take part in the courses will be able to learn something new from each other. An online community of this size has plenty of opportunities for everyone (Györgyi-Ambró, 2020).

While educators want to learn how to use tools based on our preliminary needs assessments, how much methodology do we need to pass on? If there is not enough methodology, will our participants not subordinate learning objectives to the tool?

It is a recurring dilemma between organizers and facilitators is how much theory and how much practice is needed to assign the use of tools to learning goals and not the other way around. Some elements of the previously mentioned paradigm shift may appear in the course, but how suitable is a 10-15 or even 40-hour course to pass the necessary theory, with participants also trying out the tools, which is the most important element of the course based on our preliminary needs assessments of the participants. Here we agree on that we had to go against expectations somewhat and finally chose a solution in which the theory appeared alongside the practical knowledge and the topics were accompanied by a literature recommendation – but the theoretical knowledge is not part of the course's measurement and evaluation system. Instead, we expect experimentation, the application of what has been learned and the cooperation between the participants. While this does not guarantee the use of tools that are subordinated to learning goals, the educator can arrive at a level of recognition and skill that will persuade him or her to experiment further and then follow the theoretical background on his or her own, encouraged by initial success (Györgyi-Ambró, 2020).

What are the key concerns and values of the MOOC programme contentwise?

The FLI MOOC programs were developed based on three principles. One is the stimulation of knowledge sharing and knowledge exchange in accordance with the values of the Tempus Public Foundation, and the integration of the activity into the adult education and teacher training structure of the Public Foundation. Another important principle is actuality: the topics of the MOOC had to be as current as possible every year. For this reason, we launched a needs assessment questionnaire every year (every year in autumn) to assess the needs of the potential target group that are most pressing for potential participants. Under the principle of actuality, we also implemented the practice of creating a new framework or new learning path every year, which we experimented with, examined its operation, evaluated its effects, and then reconsidered its use as a result of the analysis (after action review). The third important principle was the strengthening of collaborative learning between teachers. We subordinated to this the intention, which is unusual for MOOCs, that we worked with a relatively large number of online facilitators and that some of the activities specifically serve community building, not just individual learning.

It was a very important value for us that the Future of Learning MOOC is a methodology course, not a digital pedagogy course or robotics or other similar current focus. Throughout, we also maintained the principle that the topics of the MOOC were horizontal pedagogical topics: collaborative learning, project pedagogy, gamification, supporting students' self-regulated learning, etc. We created groups for the teachers' subject organizations, and we also made it possible for the participants to create groups, which only had to be moderated or helped and facilitated from time to time. But the organisation of the course and the learning paths was based on the holistic topics.

When planning the course, we asked the content developers for a unified approach, since our intention was to create a common MOOC and not just modules placed next to each other. We also planned linked, interdependent activities that ran throughout the entire course. With this, we also wanted to help ensure that already satisfied and committed participants are less likely to drop out of the course.

The structure of the modules was created based on uniform editing principles, which all content developers followed. On the opening pages of the topic, a short introduction, possibly an engaging story or a video or audio recording provided motivation for the participants. This was followed by a short literature-didactic summary, which helped beginner-level participants navigate the topic. During the module, we also placed content pages on the beginner and advanced level learning paths, on which we placed video or audio or, in rarer cases, textual learning materials, which were supplemented by embedded learning material elements and learning objects. For the content pages and to measure the learning results, we created and published several types of tasks at the beginner and advanced level, the effectiveness and efficiency of which were examined from several points of view. The variety of tasks was facilitated by discussions between content developers and design diagrams, which the Public Foundation regularly followed and sometimes facilitated the work process. During the content development, we also involved an external expert who was also a former methodological consultant and proofreader. The tasks were supplemented by forum posts, it was common for the participants to create an evaluated

forum post from the start. In addition, the participants in the course were able to express themselves in several forums dealing with subject-specific or technical issues. We facilitated the community-building functions with several community exercises (e.g., community map creation, introductions, partner-seeking online bulletin boards, etc.). In some special years, community building was carried out by university teaching students specially invited for this task.

At the end of the modules, all participants had the opportunity to reflect on the content, methodology and learning outcomes of the module. At the end of the course, the participants could give their opinion on the course, this questionnaire was filled out by hundreds of people every year.

The results of the different questionnaires, the theoretical background and the measurements of the efficiency of the different tasks and assignments will be published in several different articles in the upcoming months and years.

Receptions and feedbacks from the field

The FLI is one of the most successful programmes the Knowledge Centre has ever launched considering the number of its participants, the number of experts involved and their wide-range expertise, the number of issued certificates within a programme. Regarding quantitative indicators, the FLI is doing well (Györgyi-Ambró, 2019).

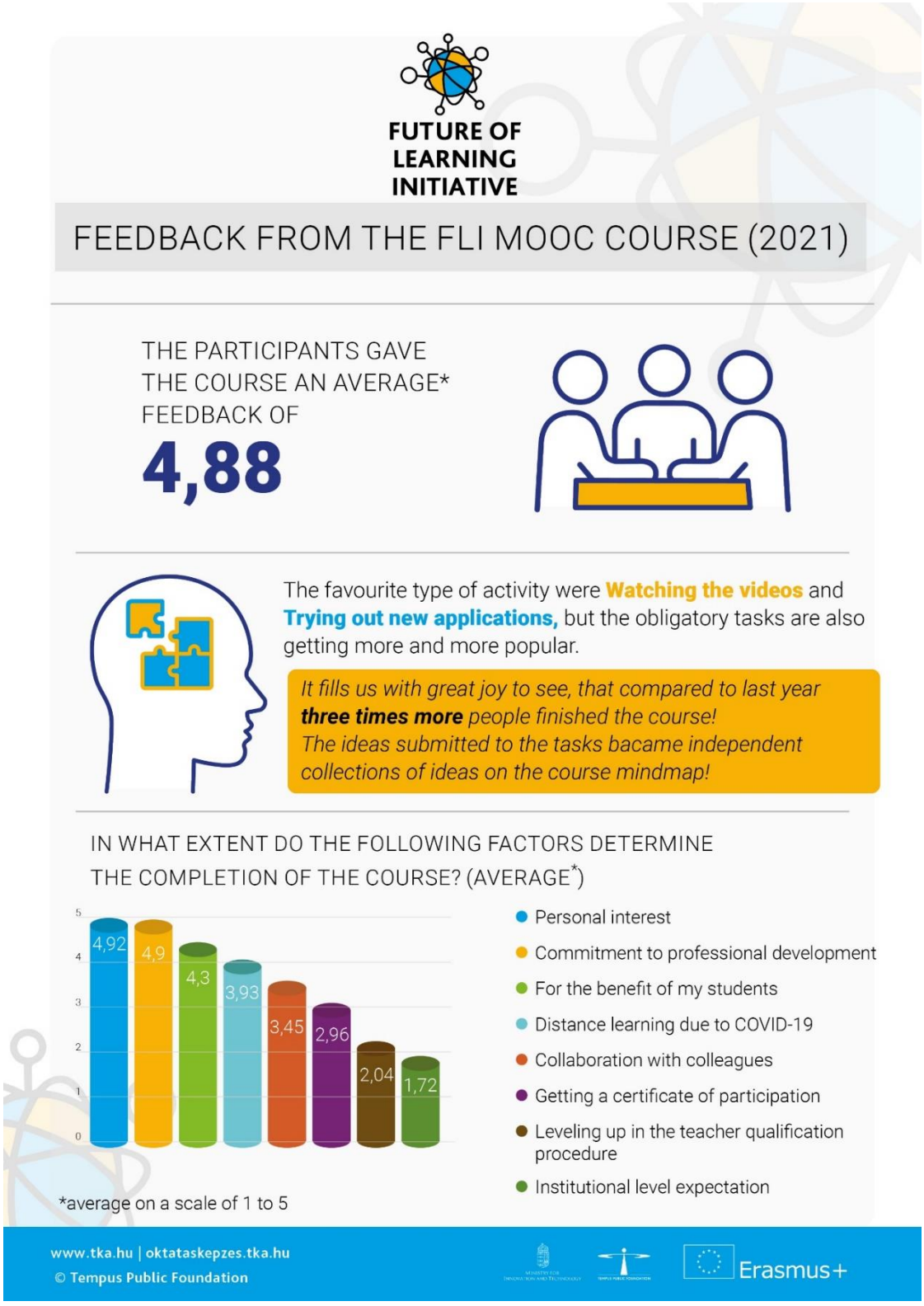
On the other hand, we are constantly monitoring the satisfaction of our participants using internationally standardised methods (see Kilgore et al., 2015). Regarding the Digital Methodology Repository, we get important feedback regarding the number of people who use the system and their feelings about it. In the Repository, there are approx. 100,000 visitors yearly, in 2020, during the pandemic, it got multiplied with an average of 50,000 visitors monthly. The YouTube channel also exploded in 2020, with tens of thousands of people visiting it during the pandemic monthly. The Future of Learning MOOC has been attended by almost 2,000 people every year so far, with a total of approx. 98-99% satisfaction rates; the engagement level of participants as well as their evaluative culture and willingness to provide feedback is extremely high, supporting the development of the community and that of reflective pedagogical practice.

The Future of Learning MOOC is the flagship of the initiative and has the greatest community-building and knowledge-democratising impact on the sector. Within the MOOC, results of participants are constantly monitored, excellent teacher facilitators provide regular feedback on participants' work, so the follow-up of not only the course but also individual participants is realised. Quality assurance tools installed within the course (regular feedback from all actors, external evaluation, research, regular monitoring, etc.) also allow us to learn a lot about the course and the needs of participants each year and implement meaningful quality improvements regularly.

Most of the teaching materials are fully open and accessible free of charge for teachers and other participants even without registration into the FLI MOOC or the Repository website. The rest of the teaching materials is also accessible for our partners and participants with registration but if somebody subscribes to our services and the initiative, they are welcomed to have all the materials free of charge forever. This is greatly appreciated

by our users because they are able and motivated to come back again and again to build new communities, founding new partnerships and finding "something interesting from the past".

Figure 4. Feedbacks from the last FLI MOOC course (2021). FLI MOOC = Future of Learning Massive Open Online Course.



Source: Tempus Public Foundation, n.d., infographic designed as internal documentation

Overall, the FLI is an initiative that fills a niche to which thousands of new teachers and other professions join each year, with outstanding satisfaction. Participants are most satisfied with the expertise, knowledge and knowledge-sharing skills of experts involved, the quality of networking and professional commitment.

The knowledge management techniques in the initiative

Approaching the FLI that has online services, we can say that the open online courses and online services have brought both the democratisation of adult education and the expansion of knowledge sharing opportunities. In addition to the many criticism of the open online content, it can certainly be said that online courses such as The Future of Learning MOOC have made a significant and remarkable contribution to the democratisation of adult education by sharing achievable learning outcomes with the wider public, with the key element of accessibility (Farkas & Györgyi-Ambró, 2021).

Practically, the elements of FLI has learning outcomes set up. Approx. 50-60 new, elaborated ideas are submitted each year to the Digital Methodology Repository using a template. We also honour owners of the best ideas with our Digital Teacher Award to recognise their outstanding achievement; 8-10 awards are presented as part of our annual Digital Education Conference. This conference is also a kind of knowledge marketplace with hundreds of participants organised each year with plenaries, roundtables and dozens of innovative workshops, sections and giveaways in order to share the gained knowledge and design new networks with live conversations and good questions. Most of our facilitators, educators and trainers of the online and offline (face to face) courses are awarded teachers with Digital Teacher Award mentioned above.

In the Future of Learning Online courses, the quality of participation in activities and tasks is monitored by facilitators who give feedback to participants. It is important that participants receive feedback regarding learning outcomes they have achieved (and areas for further development). This practice might seem strange but our participants have indicated to us that they insist on feedbacks as well as peer assistance and peer learning.

As for evaluation of the entire initiative, we also devote significant energy to the development of the initiative itself, with external experts and external evaluators assessing the results of the FLI. We usually – once or twice per year – design and implement a rapid evidence review (RER) which is a way of reviewing research and evidence on the FLI and especially the FLI MOOC. It records the main outcomes and has strong recommendations for upgrading and upscaling the Initiative and also develop the instruments: the Repository, the FLI MOOC and other channels.

The evaluation of the initiative leads us to some organisational development as well. To get more and more detailed knowledge about our initiative and the learning outcomes and findings, we usually implement the knowledge management technique of the after action review (AAR) which is usually implemented in discussions at the end of an activity or key stage to reflect on the current position and future actions. Experts, external experts and e.g. the facilitators of our courses are also involved into the AAR. This is a very good opportunity to collect the tacit knowledge of our activities and lessons learnt. To have a formal process, a retrospective review is also done in every year at the end of the FLI

MOOC (usually in May every year). For the retrospective review we use more techniques from feedbacks of participants, facilitators, associated partners and finally: one of the most reliable and valid evaluation grid known as The Quality Matters Rubrics that show a very detailed and thoroughly planned way of assessing and evaluating online courses in eight different topics:

- Course Overview and Introduction
- Learning Objectives (Competencies)
- Assessment and Measurement (inside the course)
- Instructional Materials
- Learning Activities and Learner Interaction
- Course Technology
- Learner Support
- Accessibility and Usability

The appropriate usage of the Quality Matters Rubric and the experiences of them could be read from Lowenthal et al. 2015. The results of the retrospective review is built in to the planning of the FLI MOOC and other FLI activities in the following year.

For the YouTube and Facebook channel, we are using the analytics of the social media companies provided for targeting our messages more and more appropriately, identifying our typical target groups and the most successful materials, e.g. YouTube-videos.

With the Future of Learning Initiative, we have been able to raise knowledge management principles as well as practices that have been accumulated for more than a decade to a European level, and also set the goal of further internationalising the Future of Learning Initiative. We kindly recommend you to be our guest, course participant or uploader to the Repository to gain the advantages and join to a constantly improving community across the borders.

Summary

The concept of the Future of Learning Initiative (FLI) is about supporting everyday pedagogical practice with digital tools and collaborative learning for teachers. In this space, teachers collaborate with other teachers, learn from one another and reflect on their own practices together, and for this process, our organisation provides a thoroughly planned collaborative environment, methodology and know-how. We, at the Tempus Public Foundation (TPF) believe that pedagogy will become even more effective not by digital tools but by educators' thinking, the key to change is always the educators themselves and this is confirmed by all major international research as well as policy recommendations (EU, OECD, etc.). The Future of Learning Initiative has been privileged in many ways: its current format has been shaped by careful hands of many excellent and enthusiastic professionals involved and its sustainability is ongoing thanks to governmental support, although, initially, it was a serious issue. The challenges and responses were also explained in this article. The main values and core ideas were also described in the article which are: from teachers to teachers, the constant innovation and the collaboration – between stakeholders and especially the collaborative teacher learning (CTL). We have also described

the key he motivational elements of the initiative in five short points as well as the feedbacks and the receptions from the participants. We are very proud of the results and outputs and the accomplishments that we have achieve together. At the same time, one of the key part of the initiative is the applied knowledge management techniques (knowledge marketplace, after action reviews, retrospective reviews etc.) which could lead the Reader to another side of a successful initiative – how to measure, assess and evaluate the performance of the knowledge management initiative.

Acknowledgement

The authors of this article would like to express their gratitude to all the collaborators and contributors to make this initiative successful.

First, we are grateful to the facilitators, curriculum developers and other experts for their contribution, professional job and the high-quality content. Also, we express our gratitude to the thousands of participants of the initiative for their active participation, feedbacks, professional contribution and the honest conversations. Also thank to all of our colleagues in the Knowledge Centre, Communication and IT Units for their support.

As the Future of Learning Initiative is a part of Knowledge Centre main programmes, we emphasize that this endeavor would not have been possible without the generous support of Tempus Public Foundation and the Ministry of Innovation and Technology, Hungary.

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Appendices

Appendix 1: Complex mind-map (the main collective product) of the Future of Learning MOOC in 2021

Source: Tempus Public Foundation

The mind-map includes the most important discussion topics and posts with annotation of online applications, digital methods, tools, databases etc. as well as the selected content fragmented by subjects (e.g. Hungarian language, Geography etc.), pedagogical topics (e.g. gamification, collaboration of students etc.). URL: https://www.mindmeister.com/1852435071?t=9s0sHBkcnT

Appendix 2: Training programmes of the Knowledge Centre besides the Future of Learning MOOC and other Future of Learning trainings

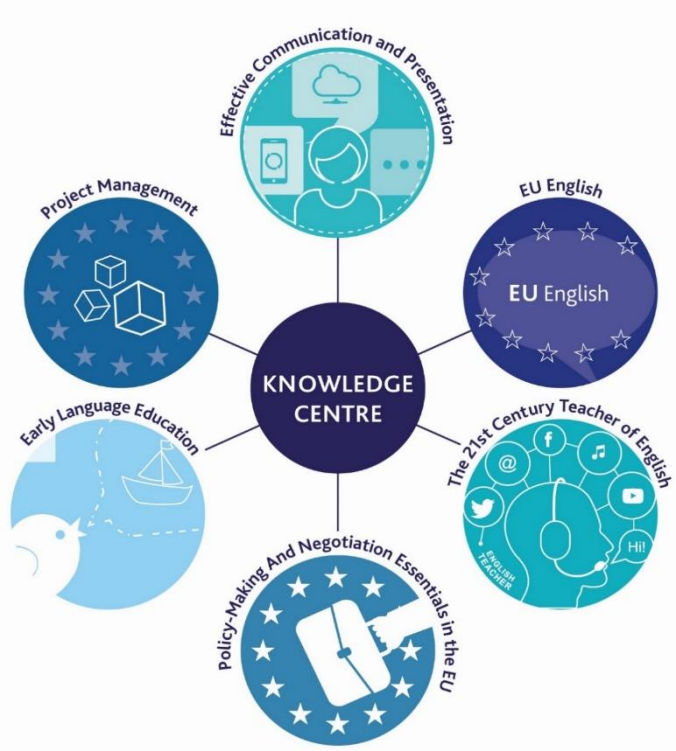
Source: Tempus Public Foundation

The trainings offered by the Knowledge Centre:

- The Future of Learning Initiative: Over the years, the Knowledge Centre founded an initiative dedicated to the cooperation between teachers. It includes the Future of Learning MOOC (massive open online course), which is one of the biggest advanced study programme for teachers in the Carpathian Basin. The main goal of it is to make teachers help other teachers and build knowledge together. At the end of the course, participants get their own certificates. The course occurs every spring. The programme is based on the needs of the participants.
- EU English: This course is based on the special needs of ministry associates. The main goal of it is to develop EU and citizen competences. Participants get to know the institutions of the EU, its processes, politics and other key concepts. It also focuses on the usage of EU terminology in both written and spoken form, sociocultural skills development, language competencies, linguistic and technical barriers and the development of IT skills as well.
- Policy-Making And Negotiation Essentials in the EU: The goal of this course is to give participants an overall view about the actual priorities of the European Union beside the most important strategic documents, institutions, their collaborations

with the Member States and the mechanisms of the negotiating situations. It also develops language skills of the participants in terms of the terminology used in EU institutions.

- The 21st Century Teacher of English: This is a course dedicated to language teaching for 12-18 year olds. It highlights concrete techniques and practices. The goal of the training is to give alternatives for teachers in class and to make them capable of self-examination and adaptation to 21st century standards.
- Early Language Education: This course is dedicated to early language education. It makes participants familiar with different methods and techniques connected to language acquisition of young children, and it also helps them incorporate those techniques into their work.
- Effective Communication and Presentation: This course is dedicated to essential presentation and performing techniques, the elements and usage of good communication and the perfection of these instruments.
- Project Management: This course is recommended to those who are involved in application processes, grants, and to leaders who are interested in the process of project management.



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*VERGLEICH DER MATHEMATIKKOMPETENZEN UND DER UNGARISCHKOMPETENZEN VON ANGEHENDEN (ERSTES STUDIENJAHR) UND SCHEIDENDEN (VIERTES STUDIENJAHR) LEHRAMTSTUDENT*INNEN*

Abstrakt
In einer im Herbst 2022 durchgeführten Untersuchung untersuchten wir Kenntnisse in zwei Bereichen, von denen wir lange glaubten, dass sie voneinander unabhängig sind, nämlich die "geisteswissenschaftlichen" und die "formalwissenschaftlichen" Kompetenzen der Studierenden. Es ist keineswegs sicher, dass die geisteswissenschaftlichen, in unserem Fall die ungarische Sprache – und die formalwissenschaftlichen, hier die mathematische Kompetenz, völlig voneinander getrennt sind. Es kann sogar passieren, dass sie Gemeinsamkeiten haben. Unter anderem interessierten uns diese Gemeinsamkeiten bei der Untersuchung, bei der wir die grundlegenden mathematischen Kompetenzen und die ungarischen Sprachkompetenzen von Lehramtsstudentinnen und Lehramtstudenten des ersten und vierten Studienjahres an der Apáczai Csere János Fakultät für Pädagogik, Human- und Sozialwissenschaften der Széchenyi István Universität erfasst haben. Mit Hilfe einer Reihe von Aufgaben versuchten wir, Antworten auf unsere Fragen zu bekommen, wie mathematisches Wissen mit Grammatikwissen zusammenhängt und ob die in der Ausbildung verbrachte Zeit einen positiven Effekt auf das Wissen der Studenten hat. Wir wollten auch herausfinden, welche Arten von Aufgaben für die Studierenden problematisch sind. In Bezug auf diese Fragen formulierten wir die folgenden Hypothesen: Die Studierende im vierten Studienjahr schneiden sowohl in Mathematik als auch in der ungarischen Sprache besser ab, als die Studierende im ersten Studienjahr. Außerdem sind die Leistungen der Studierenden im ersten und vierten Studienjahr in Mathematik besser, als die in der ungarischen Sprache, da die Mathematikaufgaben kein Hintergrundwissen erfordern, die Aufgaben in der ungarischen Sprache hingegen nicht nur technisches, sondern auch lexikalisches Wissen erfordern. Unser Ziel ist es, die Ergebnisse dieser Umfrage bei der Umgestaltung unserer Ausbildung und unseres derzeitigen Lehrplans zu nutzen. Wir wollen die Fähigkeiten und Fertigkeiten unserer Studierenden so weit wie möglich fördern, ihnen ein noch gründlicheres Wissen zu vermitteln. Wir möchten erreichen, dass die gegenwärtig durchgeführte Untersuchung und die ausgewerteten Ergebnisse einen positiven Einfluss auf den zukünftigen Lehr- und Lernprozess in unserem Institut haben.

Schlüsselwörter: Mathematik, ungarische Sprache, Ausbildung von Lehramtstudentinnen und Lehramstudenten

Abstract
In a research carried out in the fall of 2022, we investigated the knowledge of two areas, long believed to be independent, "humane" and "real" competences. It is not at all certain that humanities, in our case, Hungarian language and mathematical competence are completely separate from each other, and it may even happen that they show the same identity. Among other things, we were interested in this in the research, in which we mapped the basic mathematical and Hungarian language competencies of first- and fourth-year teaching students studying at the Apáczai Csere János Faculty of Pedagogy, Human and Social Sciences of Széchenyi István University. With the help of a set of tasks, we tried to get answers to our questions about how mathematical knowledge is related to grammar knowledge, and whether the time spent in training has a positive effect on the students' knowledge. We also wished to find out what types of assignments were problematic for students. In relation to these questions, we made the following hypotheses: The outgoing students perform better in both mathematics and the Hungarian language than the incoming students. Also, the performance of both the first- and fourth-year students will be better in math than in Hungarian language, because while the math task set does not require background knowledge, the Hungarian language task set does. Our goal is to use the results of the survey during the transformation of our education and of our current curriculum. We want to develop the abilities and skills of our students as much as possible in order to provide them with even more thorough knowledge. We also want to ensure that the examination carried out in the present and the evaluated results have a positive effect on the future teaching-learning process.

Keywords: mathematics, Hungarian language, teacher training

Einführung

Seit Jahrhunderten hat sich in der Welt und damit auch im öffentlichen Bewusstsein der Glaube durchgesetzt, dass die Humanwissenschaften und die Realwissenschaften zwei getrennte Bereiche des Lebens und der Kompetenzen sind. Dies ist die Grundlage der Bildung und der Lehrpläne. Sogar über die einzelne Person kann man bereits in der Primarschule sagen, ob sie eher human oder eher real orientiert ist. Aber ist es wirklich wahr, dass die humanwissenschaftlichen und die realwissenschaftlichen Kompetenzen nicht miteinander zusammenhängen? Ist es war, dass diejenigen, die in dem einem Bereich besser abschneiden, in dem anderen zwangsläufig schlechter sind? Bevor wir uns mit den Fragen dieser Untersuchung befassen, möchten wir klarstellen, zu welchen Kompetenzen die Mathematik, als Wissenschaft zurechenbar ist. Traditionell sieht man sie als Realfach an, da alle Wissenschaften auf ihr beruhen und ihre Ergebnisse nutzen. Das Wort "real" bedeutet alles, was in der materiellen Welt existiert und sich mit der realen Welt beschäftigt, wie die Naturwissenschaften (Physik, Chemie, Biologie, Geografie usw.).

Ein weiteres Merkmal dieser Wissenschaften ist ihre Objektivität, was im Gegensatz zu den Geisteswissenschaften bedeutet, dass sie mit Fakten, überprüfbaren Daten und klar

definierten Konzepten arbeiten. Das Wort "human" hingegen bedeutet "von Menschen gemacht", d. h. Wissenschaften, die von Menschen kreirt sind und mit dem Menschen zu tun haben. Die Mathematik ist daher weder eine Geistes- noch eine Naturwissenschaft, denn obwohl sie ein, vom Menschen geschaffenes System ist, gibt es kaum eine so spezielle Kompetenz, als die Mathematik: Sie gilt als abstrakte Wissenschaft. Wir halten es für möglich, dass die humanwissenschaftliche (in unserer Studie die ungarische Sprachkompetenz) und die mathematische Kompetenz zusammenhängen, dass sie miteinander verbunden sind (Turcsik, 2019).

Die Verbindung der Mathematik und der Sprachwissenschaft

Es ist nicht neu, Mathematik und Linguistik im Zusammenhang zu sehen, da sie Grenzwissenschaften sind. Der Prozess, in dem sie zu Grenzwissenschaften wurden, begann im ersten Drittel des 20. Jahrhunderts, und diese gegenseitige Abhängigkeit und Verflechtung hat sich seither fortgesetzt (Pásztor Kicsi, 2014/4.; Marcus, 1977). Der Begriff „mathematischen Linguistik" wurde erstmals in den 1930er Jahren verwendet. Die vielleicht älteste der Methoden der mathematischen Linguistik ist die Sprachstatistik, mit der sich die Verbreitung aller quantifizierbaren Elemente einer Sprache messen lässt.

Sprachstatistiken spielen sowohl bei quantitativen als auch bei qualitativen Studien eine wichtige Rolle: So können beispielsweise die ermittelten Häufigkeitsindikatoren verglichen werden, um festzustellen, ob es statistische Regelmäßigkeiten gibt, die sich auf ihre Verwendung auswirken (Adamikné Jászó, 2007).

Wenn wir mit statistischen Methoden Regelmäßigkeiten aufdecken können, die in allen Sprachen vorhanden sind, nennen wir diese, statistische Gesetze. Die statistischen Regelmäßigkeiten des Sprachgebrauchs sind nicht vom Sprecher, der Situation oder dem Thema abhängig und können in jeder größeren Einheit unserer Sprache oder Schrift festgestellt werden. Aus allgemeinen Studien lässt sich ableiten, dass unser sprachliches Verhalten in der Praxis statistischen Erwartungen folgt, ohne dass wir die geringste Anstrengung unternehmen, die statistischen Merkmale zu validieren (Adamikné Jászó, 2007). Bei unseren Untersuchungen haben wir auch die Instrumente der Sprachstatistik eingesetzt.

Der zweite Bereich der mathematischen Linguistik ist die Analyse und Modellierung formaler Sprachstrukturen nach der mathematischen Logik. Die gebräuchlichsten logischen Operationen in der Sprachbeschreibung sind Eliminierung, Kontraktion, Expansion und Transformation. Bei der Beschreibung dieser Elemente entsprechen bestimmte Symbole jeweils einem bestimmten Sprachelement. Die Einbeziehung der Logik in die Beschreibung sprachlicher Strukturen ist vor allem für den linguistischen Strukturalismus und die generative Grammatik des 20. Jahrhunderts charakteristisch. Sprachliche Strukturen werden häufig in Form von Formeln dargestellt, wodurch die Beziehungen zwischen sprachlichen Strukturen explizit werden. Der "Kompetenzbegriff der Theorie, wonach das menschliche Gehirn über den angeborenen (ererbten und artspezifischen) Sinn verfügt, aus einer endlichen Anzahl sprachlicher Elemente eine unendliche Anzahl grammatikalisch korrekter Sätze zu erzeugen, hat die Linguisten herausgefordert, ein Modell zu entwickeln und zu verfeinern, das die Erzeugung beliebiger Texte ermöglicht".

(Pásztor Kicsi, 2014/4.). In unserer langfristigen Forschung werden wir bezüglich der Operationen der Logik auch versuchen die mögliche Interpretation von mindestens/höchstens, bzw. von und/oder zu erfassen.

Der dritte Bereich, in dem Mathematik und Linguistik miteinander verflochten sind, ist die Computerlinguistik, die inzwischen eine eigenständige Disziplin ist. Ursprünglich umfasste es Anwendungen, wie die vergleichende Analyse von Texten in verschiedenen Fremdsprachen, die Korrektur von Tippfehlern, die Texterstellung, das computergestützte Sprachenlernen usw. Mit der rasanten Entwicklung und Ausbreitung der Digitalisierung hat sich die Computerlinguistik jedoch zu einer eigenständigen Disziplin entwickelt. Die wichtigsten Forschungsrichtungen sind: maschinelle Übersetzung, Forschung im Bereich der künstlichen Intelligenz, maschinelle Sprachproduktion, maschinelle Spracherkennung und Sprachtechnologien/ Kommunikationstechnologien (Adamikné Jászó, 2007).

Im Zusammenhang mit der Beziehung zwischen Mathematik und Linguistik wurde beobachtet, dass Mathematik auch eine spezifische, abstrakte Sprache ist (Bóta, 2011). Die Relevanz dieser Behauptung besteht darin, dass die Mathematik, wie die natürlichen Sprachen, über einen grundlegenden Satz von Symbolen verfügt, die die Grundbegriffe, das Vokabular der mathematischen Sprache, bezeichnen. Andererseits verfügt sie über ein Regelwerk, das die Beziehung zwischen den Zeichen, ihre Kombinierbarkeit, die "Grammatik" der mathematischen Ebenen und Operationen definiert, sowie über einen metasprachlichen Apparat, der die Interpretation des Codesystems und der Regeln, bzw. die Beschreibung der mathematischen Sprache, ermöglicht (Pásztor Kicsi, 2014/4.).

Leshem und Markovits reflektieren ebenfalls über die Beziehung zwischen diesen beiden Disziplinen und vergleichen Englisch und Mathematik als zwei Sprachen miteinander. Sie argumentieren, dass Englisch die internationale Sprache der Welt ist, während die Mathematik sowohl die Sprache der Wissenschaft als auch die Sprache des täglichen Lebens ist. Sie vergleichen Mathematik und Englisch und versuchen nachzuweisen, dass beide ein ähnliches Denken des Einzelnen erfordern (Leshem S., 2013). Die enge Beziehung und die Ähnlichkeiten im Denken zwischen diesen beiden Wissenschaften werden auch in einer Studie von Li und Wang aus dem Jahr 2013 untersucht (Li F., 2013).

Theoretischer Hintergrund

In der Primar- und Sekundarstufe sind die beiden wichtigsten Fächer Mathematik sowie die ungarische Sprache und Literatur. Das sind die Fächer mit der höchsten Stundenanzahl. Auf diese beiden Kompetenzen wird in der Grundschule aufgebaut, und sie dienen später als Grundlage für ein breiteres Wissen und als Grundlage für zahlreiche andere Fächer. Aus diesem Grund haben wir uns entschieden, in unserer Umfrage die mathematischen und ungarischen Sprachkompetenzen zu vergleichen.

Unser Forschungsthema ist kein Pionierthema: Andere haben bereits mathematische und sprachliche Kompetenzen verglichen, und in beiden Bereichen wurden diagnostische Maßnahmen durchgeführt, wenn auch nicht unter genau diesem Aspekt.

Farukh, Ahmad und Shah verglichen die Mathematik- und Sprachkenntnisse von pakistanischen Jungen und Mädchen in der Grundschule. Sie fanden heraus, dass sprachliche und mathematische Fähigkeiten dieselben Teilfertigkeiten und dieselben Gehirnbereiche

für die Verarbeitung und psychologische Entwicklung nutzen. Mathematische Fähigkeiten stehen in engem Zusammenhang mit Sprachkenntnissen, und ihre Verarbeitung hängt von Sprachkenntnissen ab. Es ist daher sehr wahrscheinlich, dass diese Kompetenzen voneinander abhängig sind und eine starke Korrelation zwischen ihnen zu erwarten ist. Die Daten wurden mithilfe der Pearson-Korrelationsanalyse, der hierarchischen Regressionsanalyse und der Faktorenanalyse analysiert, um die Beziehung zwischen diesen Fähigkeiten zu ermitteln (Farukh A., 2020).

Viesel-Nordmeyer, Ritterfeld und Bos verglichen die mathematischen und (deutschen) sprachlichen Fähigkeiten von Kindern mit Lernschwierigkeiten im Kindergarten und in der Grundschule. Sie gingen von der Prämisse aus, dass die beiden Arten von Lernschwierigkeiten häufig zusammenfallen, und versuchten, die Gründe dafür zu ermitteln und ihre Erkenntnisse durch Messungen zu untermauern (Viesel-Nordmeyer N., 2021).

Szirmai Hajnalka untersuchte die Zusammenhänge zwischen mathematischen und sprachlichen Fähigkeiten. Szirmai ist der Ansicht, dass eine ziemlich alte Grundfrage der Begabungsforschung darin besteht, wie sich die Begabung in einem Bereich auf andere Bereiche überträgt. Sie befasst sich mit einer anderen Altersgruppe und einem anderen Bereich der sprachlichen Fähigkeiten als die vorliegende Studie, aber ihre Ergebnisse sind es wert, erwähnt zu werden. Szirmai schließt aus ihren Erkenntnissen, dass es keine enge Verbindung zwischen den beiden Talenten gibt. Sie analysiert die Unterschiede zwischen den sprachlichen und mathematischen Fähigkeiten von Mädchen und Jungen und berichtet über den Zusammenhang zwischen den tatsächlichen sprachlichen und mathematischen Fähigkeiten und der Evaluation dieser seitens der Lehrenden (Szirmai, 2003/5). Weiters führten Csapó Benő, Csíkos Csaba, Steklács János und Molnár Gyöngyvér vom Institut für Bildungsforschung und Entwicklung diagnostische Messungen durch (Csapó, Steklács, & Molnár, 2015).

Das grundlegende Ziel des diagnostischen Auswertungsprogramms war die Entwicklung eines Online-Beurteilungssystems, mit dem die Fortschritte der Schülerinnen und Schüler vom Eintritt in die Schule bis zum Ende der sechsten Klasse verfolgt werden können. Das detaillierte Aufgabensystem umfasste drei Hauptbereiche: Lesen und Leseverstehen, Mathematik und Naturwissenschaften. Auf Kenntnisse, Fähigkeiten und Fertigkeiten also, die für den späteren schulischen und außerschulischen Lernerfolg von grundlegender Bedeutung sind, denn Lesen und Schreiben, Mathematik und Naturwissenschaften sind auch die Hauptbereiche, auf die sich internationale Bewertungsprogramme konzentrieren (Csapó, Csíkos, & Molnár, 2015).

Forschungsgegenstand und Hypothesen

Zu Beginn des akademischen Jahres 2022/2023 starteten wir ein Forschungsprojekt mit dem Ziel, die mathematischen und muttersprachlichen Fähigkeiten der Studierenden der Apáczai Csere János Fakultät für Pädagogik, Human- und Sozialwissenschaften der Széchenyi István Universität zu bewerten.

Wir taten dies, weil mehrere Forschungen zeigen, dass das Niveau des Sprachgebrauchs mit kognitiven Operationen, Leistungsniveau und kognitivem Stil zusammenhängt. In dieser Studie versuchten wir, die Frage zu beantworten, wie mathematisches

Wissen mit grammatikalischem Wissen zusammenhängt. Das Ziel dieser Studie war es, die Ergebnisse unserer angehenden und scheidenden Studierenden zu vergleichen. Die Umfragen wurden in der ersten Woche des Herbstsemesters 2022/2023 durchgeführt. Dies war wegen der Studienanfänger wichtig, um sicherzustellen, dass die Informationen, die sie später während ihrer Ausbildung erhalten, ihr Wissen nicht verändern. Die Studierende des Abschlussjahrgangs stehen kurz vor dem Beginn ihrer Praktika, so dass die Ergebnisse wichtige Informationen darüber liefern, ob sie gut auf ihre künftige Laufbahn vorbereitet sind. Die Umfrage bestand aus 22 Aufgaben, die verschiedene Themen aus den Bereichen der Mathematik und der Grammatik abgedeckt haben.

An der Umfrage nahmen 20 Studierende aus dem ersten und 26 Studierende aus dem vierten Studienjahr teil. Die Ergebnisse eines Studenten aus dem vierten Studienjahr wurden ausgeschlossen, weil er keine der Mathematikaufgaben gelöst hat. Wir glauben, dass er dies mit Absicht getan hat und nicht, weil das seine wirkliche Leistung war. Die Stichprobe von 45 Studierenden kann aufgrund der geringen Anzahl von Aufgaben nicht als repräsentativ angesehen werden, aber in unserer Fakultät repräsentiert sie fast 100 % unserer Studierenden des ersten und vierten Studienjahres (es fehlten nur wenige). Wir verwendeten einen Test, der 11 Mathematikaufgaben und 11 Aufgaben in ungarischer Sprache und Literatur enthielt. Für jede Aufgabe gab es maximal 3 Punkte. Die Punkte wurden wie folgt vergeben: 0 Punkte wurden vergeben, wenn die Studierende keine Antwort auf die Aufgabe gaben. 1 Punkt wurde vergeben, wenn sie die Aufgabe begonnen haben, aber diese nicht korrekt durchgeführt wurde. 2 Punkte wurden vergeben, wenn der Gedankengang gut war, aber am Ende doch etwas schief ging. Für eine vollständig gute Lösung wurden 3 Punkte vergeben.

Die Hypothesen:

A) Scheidende Studierende (viertes Jahr) schneiden sowohl in Mathematik als auch in Ungarisch besser ab als angehende (erstes Jahr).
B) Sowohl die Studierende des ersten, als auch des vierten Studienjahres werden in Mathematik besser abschneiden als in Ungarisch, denn während für den Mathematiktest keine Vorkenntnisse erforderlich sind, erfordert der Ungarischtest lexikalische Vorkenntnisse.

Die 22 Aufgaben sind so konzipiert, dass sie die wichtigsten Themen der ersten sechs Klassen in Mathematik und Ungarisch abdecken (Ambrus, et al., 2009; Ambrus, et al., 2010). So wurden (mit Ausnahme der 19. Grammatikaufgabe) keine Aufgaben gestellt, die über den Lehrplan der sechsten Klasse hinausgingen. Es gab einige Aufgaben, die Grundwissen, Kenntnisse der Rechtschreib- und Grammatikregeln, komplexeres Denken und logisches Schlussfolgern usw. erforderten. Wir achteten darauf, sowohl bezüglich Mathematik, als auch der Grammatik, Aufgaben auszuwählen, die mehr als eine gute Lösung hatten, und wir wollten auch sehen, ob die Studierende dies bemerken würden. Da es sich um angehende Lehrerinnen und Lehrer handelt, wäre in allen Fällen eine Leistung von 100 % zu erwarten gewesen, da keine der Aufgaben mehr Wissen erforderte, als die Kinder, die sie unterrichten werden, benötigen würden, um diese Aufgaben lösen zu können.

Der Fragebogen wurde von den Studierenden selbstverständlich anonym ausgefüllt, sie wurden lediglich um die Angabe ihrer Note und ihres Geschlechts gebeten. Andere

Forscher haben die mathematischen und ungarischen Sprachkompetenzen von Jungen und Mädchen auch miteinander verglichen, aber wir konnten einen solchen Vergleich nicht anstellen, da sich nur zwei junge Männer, einer im ersten Studienjahr und einer im vierten Studienjahr, auf den Lehrerberuf vorbereiten, so dass ein solcher Vergleich sinnlos und nicht repräsentativ gewesen wäre. Sie hatten 90 Minuten Zeit, um 22 Aufgaben zu lösen.

Bei der Formulierung der Aufgaben wurde auch berücksichtigt, dass eine mögliche falsche Lösung nicht nur darauf zurückzuführen sein könnte, dass die Person die Aufgabe nicht lösen konnte, sondern auch auf Verständnisprobleme: Die Person konnte die Aufgabe nicht verstehen.

Aus Zeitmangel versuchen wir nicht, alle Aufgaben zu bewerten, sondern heben die wichtigsten und interessantesten, sowie einige der Typenfehler hervor.

Analyse und Auswertung der Ergebnisse

Aggregierte Ergebnisse

Die Ergebnisse sind in der folgenden Tabelle zusammengefasst. Die Tabelle zeigt den Prozentsatz der Studierenden, die Punkte erreicht haben. Dies war notwendig, damit die Daten besser verglichen werden können, weil die beiden Jahrgänge nicht gleich groß waren. Bei fast allen Aufgaben ist festzustellen, dass die Studierende des vierten Jahrganges die Aufgaben besser oder zumindest präziser lösen konnten. Dies ist darauf zurückzuführen, dass sie eine dreijährige Hochschulausbildung absolviert haben, in der sie die Möglichkeit hatten, etwaige Defizite auszugleichen und falsche Vorstellungen zu korrigieren. Da sie mehrere Semester Unterrichtserfahrung hinter sich haben, sind sie mit dem Lehrplan der Unterstufe und den Aufgabentypen besser vertraut und konnten einige der Aufgaben der Sekundarstufe, die sie vielleicht vergessen haben, während ihres Studiums wieder kennenlernen. Die Tabelle zeigt auch eindeutig, welche Aufgaben sowohl für Studienanfänger, als auch für Studierende im vierten Jahr problematisch sind. Beispiele hierfür sind Aufgabe 8 in Mathematik und Aufgabe 19 in ungarischer Grammatik. Außerdem ist festzustellen, dass Aufgabe 19 auch mit Mathematik zu tun hat, da sie logische Operationen benötigt, die Grundlagen für die Antworten auf die Fragen sind und auf der Grundlage dieser Operationen eine Entscheidung getroffen werden muss.

Diese Aufgaben enthalten grundlegende Probleme, die für fast alle Altersgruppen schwierig sind. Die Umfrage, die wir gerade durchgeführt haben, ist für uns sehr interessant und wichtig, weil wir uns im Rahmen unserer Lehrplanentwicklung auf die Verbesserung dieser Probleme konzentrieren können.

Tabelle 1: Ergebnisse der Aufgaben in prozentualer Verteilung

I. Jhg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
0 Punkte	0	0	10	0	0	0	0	5	5	5	0	10	5	0	0	0	10	0	65	20	10	20
1 Punkt	30	20	50	20	20	0	15	55	0	45	55	10	5	25	70	40	40	5	10	30	50	20
2 Punkte	0	0	5	5	10	25	35	0	0	10	45	55	25	75	30	50	50	20	10	40	35	55
3 Punkte	70	80	35	75	70	75	50	40	95	40	0	25	65	0	0	10	0	75	15	10	5	5

IV. Jhg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
0 Punkte	0	0	0	0	0	8	0	8	4	0	4	8	0	0	4	4	16	0	36	0	8	12
1 Punkt	16	0	0	4	8	0	4	52	0	40	28	20	8	4	36	12	12	0	8	28	64	44
2 Punkte	0	0	20	4	4	4	40	16	0	8	60	32	40	40	56	68	56	4	36	52	24	12
3 Punkte	84	100	80	92	88	88	56	24	96	52	8	40	52	56	4	16	16	96	20	20	4	32

Quelle: eigene Quelle

Die aggregierten Durchschnittsergebnisse sind nachstehend aufgeführt. Der Vergleich der Ergebnisse zeigt auch, dass die Studierende im vierten Studienjahr sowohl insgesamt, als auch in den einzelnen Fächern besser abschneiden. Es ist jedoch auch festzustellen, dass die Studierende im ersten Studienjahr nur 65 % der maximal möglichen 66 Punkte erreichten, während die Studierende im vierten Studienjahr im Durchschnitt 73% erreichten.

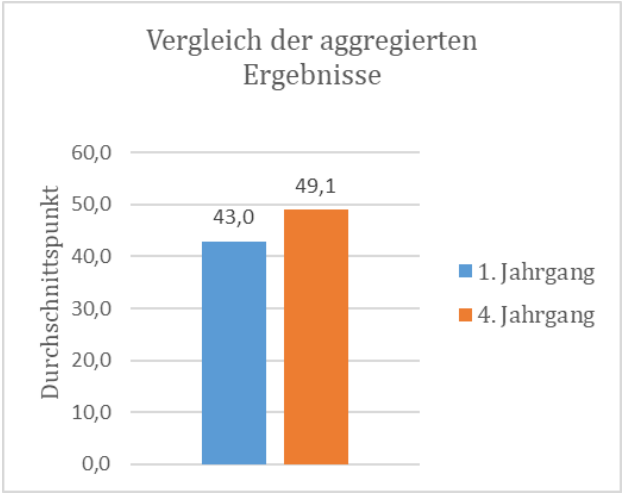
Betrachtet man nur die Mathematik, so erreichten die Studierende im ersten Studienjahr 74% der Gesamtpunktzahl, während die Studierende im vierten Studienjahr 84 % erreichten. Was die Ergebnisse der ungarischen Sprache betrifft, so haben die Studienanfänger 55% und die Absolventen des vierten Jahrgangs 65 % der Gesamtpunktzahl erreicht.

Tabelle 2: Aggregierte Ergebnisse in Punkten

	1. Jahrgang			4. Jahrgang		
	Mathematik	Ungarisch	insg.	Mathematik	Ungarisch	insg.
Durchschnitt	24,7	18,3	43,0	27,7	21,4	49,1
Streuung	3,4	3,2	4,7	3,1	4,1	6,1

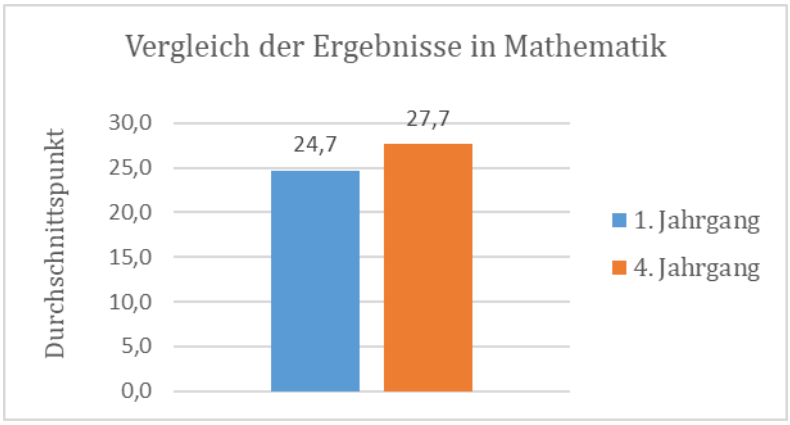
Quelle: eigene Quelle

Schaubild Nr. 1: Vergleich der aggregierten Ergebnisse



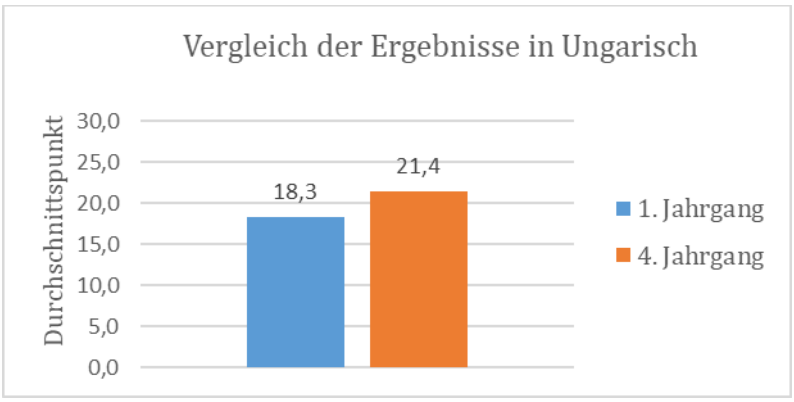
Quelle: eigene Quelle

Schaubild Nr. 2: Vergleich der Ergebnisse in Mathematik



Quelle: eigene Quelle

Schaubild Nr. 3: Vergleich der Ergebnisse in Ungarisch



Quelle: eigene Quelle

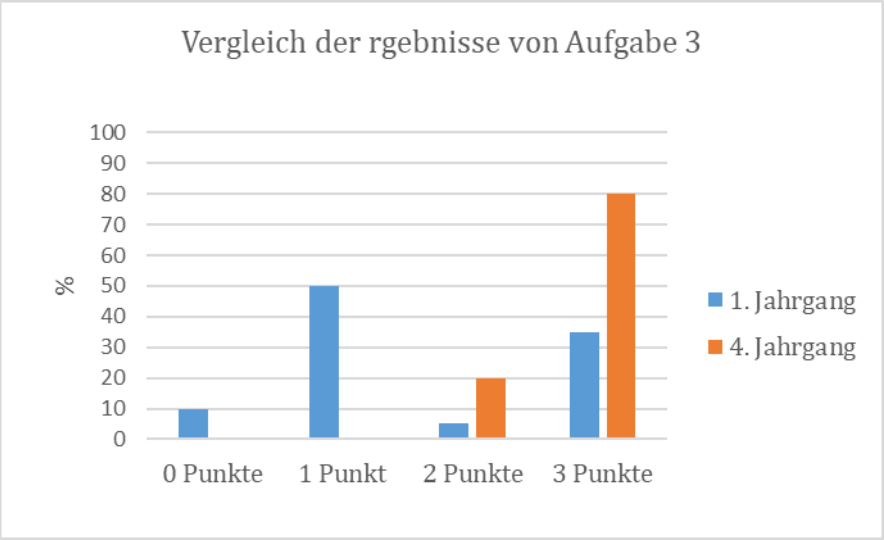
Einige wichtige Herausforderungen

Bei einigen Aufgaben haben wir auch den Anteil der gelösten Aufgaben untersucht. Die Anzahl der Punkte zeigt uns, welche Probleme bei den einzelnen Aufgaben aufgetreten sind. Es gab einige typische Probleme, die wir nun vorstellen möchten. Diese Messungen und die sich daraus ergebenden Probleme und Unzulänglichkeiten helfen uns bei der Entwicklung des Lehrmaterials, bzw. bei der Verbesserung des Niveaus unserer Lehrveranstaltungen.

Analyse der Aufgabe 3

In dieser Aufgabe geht es um die Kenntnis der römischen Ziffern:
Írd le a következő római számokat arab számmal:
(Schreibe die folgenden römischen Ziffern in arabische Ziffern um:)
LXV =....,
MMMDCLXXVII =....
Dies ist im Prinzip keine schwierige Aufgabe, aber es scheint, dass diejenigen, die in ihrem Praktikum mehr mit römischen Ziffern zu tun hatten, erfolgreicher sind. Unserer Meinung nach erinnern sich Erstklässler nicht an die römischen Zahlen, weil diese in der Sekundarstufe nicht so häufig im Lehrplan vorkommen.

Schaubild Nr. 4: Vergleich der Ergebnisse von Aufgabe 3



Quelle: eigene Quelle

Analyse der Aufgabe 5

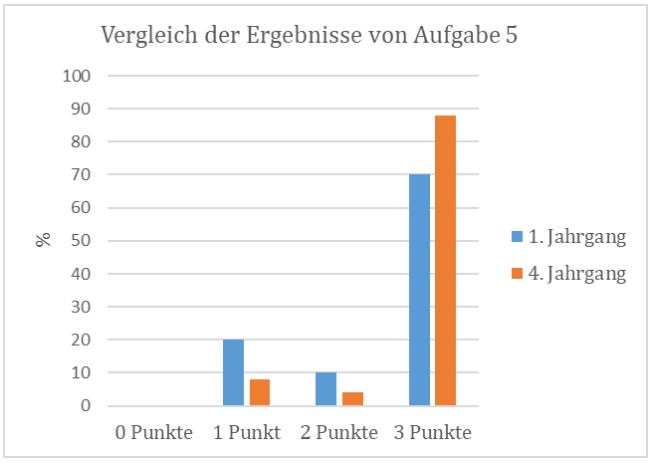
Mit dieser Übung soll die Kenntnis der Werte unterhalb des Meeresspiegels, d. h. die Kenntnis der negativen Zahlen geprüft werden.

Ein U-Boot schwimmt 700 Meter unter dem Wasserspiegel. Der neue Befehl lautet, 200 Meter tiefer zu tauchen. Wie viele Meter muss er aufsteigen, um das 126 Meter tief liegende Objekt zu erreichen?

(Egy tengeralattjáró 700 méterrel a víz szintje alatt lebeg. Az új parancs szerint 200 m-rel lejjebb kell merülnie. Hány métert emelkedjen ahhoz, hogy a 126 m mélyen lévő tárgyat elérje?)

Bei der Lösung dieser Aufgabe haben die Studierende nicht bedacht, dass sie die Daten als negative Zahlen hätten betrachten sollen, aber es wurde akzeptiert, wenn sie eine gute Lösung mit positiven Zahlen gaben. Der Prozentsatz der Studierenden, die eine gute Lösung gaben, war also hoch.

Schaubild Nr. 5: Vergleich der Ergebnisse von Aufgabe 5



Quelle: eigene Quelle

Analyse der Aufgabe 8

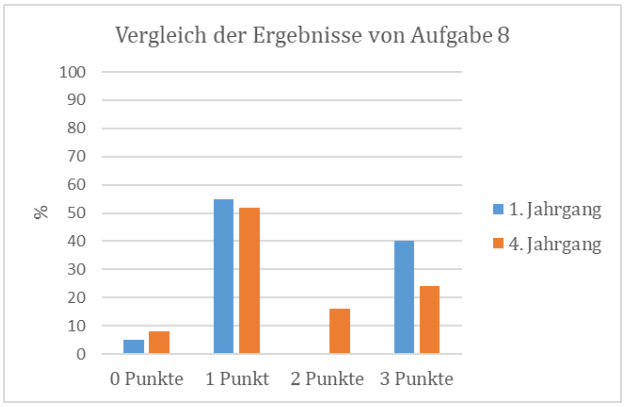
Eine der erfolglosesten Mathematikaufgaben war Aufgabe 8. Der Übergang zwischen den Lebensaltern und dem Verhältnis zwischen ihnen ist auf allen Bildungsebenen immer ein Problem.

Heni anyukája 20 éves volt, amikor Heni született. Öt év múlva anyukája háromszor annyi idős lesz majd, mint a lánya. Hány éves most Heni?

(Henriettes Mutter war 20, als Henriette geboren wurde. In fünf Jahren wird ihre Mutter dreimal so alt, wie ihre Tochter sein. Wie alt ist Henriette jetzt?)

Viele Student*innen folgten nicht den nötigen Schritten einer textbasierten Übung. Hätten sie am Ende im Text nochmals nachgelesen, hätten sie gemerkt, dass die Lösung nicht richtig ist.

Schaubild Nr. 6: Vergleich der Ergebnisse von Aufgabe 8



Quelle: eigene Quelle

Analyse der Aufgabe 10

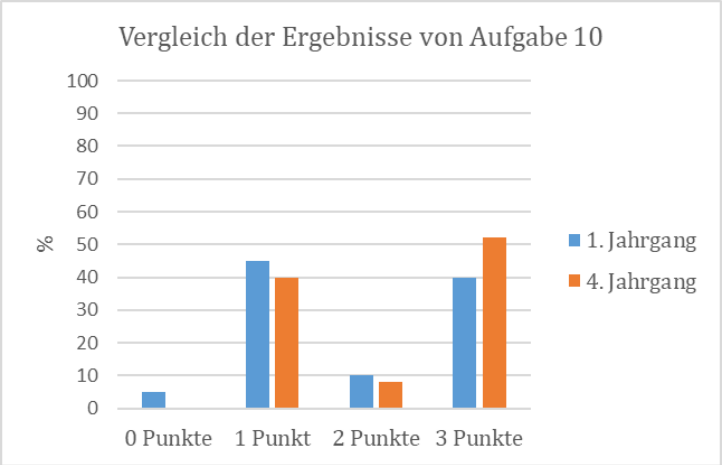
Diese Übung ist ein Denkanstoß. Auch wenn den Ergebnissen zufolge die geografischen Kenntnisse am besten sind, müssen die Proportionen betrachtet werden, da die Gesamtpunktzahl nicht gleich ist.

Kati három dolgozatot írt egy nap alatt. Matematikából 40 pontból 29-et, nyelvtanból 24 pontból 15-öt, földrajzból pedig 50 pontból 33-at ért el. Melyik dolgozat sikerült a legjobban? Melyik a legrosszabbul?

(Kati schrieb drei Schularbeiten an einem Tag. Sie erzielte 29 von 40 Punkten in Mathematik, 15 von 24 Punkten in Grammatik und 33 von 50 Punkten in Geografie. Welche Schularbeit ist am besten gelungen? Welches am schlechtesten?)

Die meisten derjenigen, die nur 1 Punkt erreicht haben, lagen darin falsch, dass sie auf den Punktwert schauten. Diejenigen, die 2 Punkte erreichten, hatten ein Rechenproblem.

Schaubild Nr. 7: Vergleich der Ergebnisse von Aufgabe 10



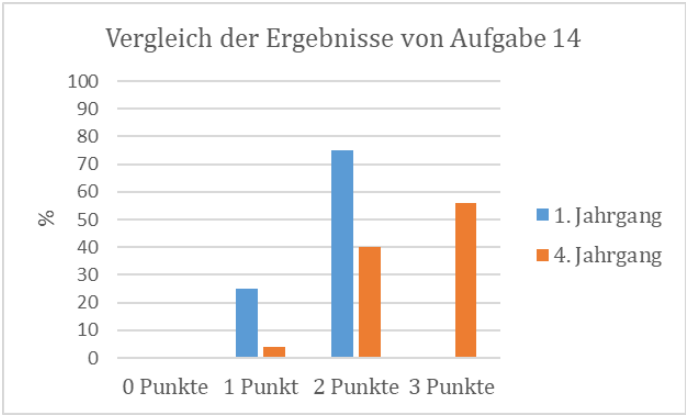
Quelle: eigene Quelle

Analyse der Aufgabe 14

In Aufgabe 14 fragten wir die Studierende nach ihrem Wissen über Silbentrennung. Die Aufgabe lautete wie folgt: *Szótagold (válaszd el) az összes lehetséges helyen a szavakat: télen, maharadzsa, mechanikus, krumpli, Shakespeare, loccsan!* (*Trenne diese Wörter an allen möglichen Stellen: télen, maharadzsa, mechanikus, krumpli, Shakespeare, loccsan!)*

Auch bei dieser Aufgabe sind die Ergebnisse der Studierenden des vierten Studienjahres wesentlich besser. Nur sie erreichten die Höchstpunktzahl von 3 Punkten, besser noch: mehr als die Hälfte des vierten Jahrganges erzielte bei dieser Aufgabe die höchste Punkteanzahl. Dies ist auch deshalb beruhigend, weil der Unterricht von Silbentrennung bereits in der ersten Klasse der Primarschule beginnt und die Kinder in den Klassen 2 bis 4 fast alle Regeln der Silbentrennung lernen. Der typischste Fehler war die Silbentrennung des Wortes Shakespeare, bei der fast keiner der Studierenden im ersten Studienjahr wusste, dass es nach der Aussprache, d. h. nur an einer Stelle: Shakes-peare, silbiert werden kann. Erwähnenswert ist auch das Wort loccsan, dessen Silbentrennung wahrscheinlich nicht aus Unkenntnis der Regeln, sondern aus Faulheit erfolgte: Viele von ihnen zogen einfach einen Strich nach der ersten Buchstabe c, während die korrekte silbierung locs-csan lautet, d. h. der Laut cs muss zweimal geschrieben werden.

Schaubild Nr. 8: Vergleich der Ergebnisse von Aufgabe 14



Quelle: eigene Quelle

Analyse der Aufgabe 15

Diese Aufgabe konzentrierte sich auf einen der schwierigsten Bereiche der Rechtschreibung. Die Schreibweise von Eigennamen, bzw. von geografischen Namen, ist für viele Menschen ein Problem, vor allem, wenn diese mit dem Zeichen -i versehen werden müssen. Die Aufgabe lautete wie folgt:

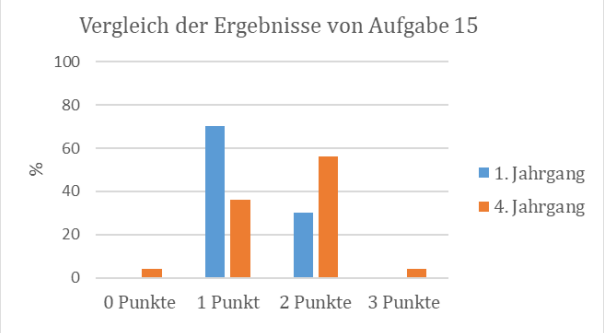
Ha kell, pótold a hiányzó kötőjelet, majd írd mellé a megadott szavakat –i képzővel!
(Ergänze gegebenenfalls den fehlenden Bindestrich und schreibe dann die Wörter mit dem Zeichen -i daneben.)
a) Dunántúli középhegység (Transdanubisches Zentralgebirge)
b) Győr Moson Sopron megye (Komitat Győr Moson Sopron)
c) Kossuth híd (Kossuthbrücke)
d) Bakony hegység (Bakony-Gebirge)
e) Fekete tenger (Schwarzes Meer)

Wie man im Text sehen kann, bestand diese Frage aus zwei Teilen: Zum einen musste das Wort mit Bindestrich geschrieben werden, und zum anderen musste das Wort auch mit dem Zeichen -i geschrieben werden. Einige waren bereits mit dem Verständnis der Aufgabe überfordert, da in keinem der Fälle ein Bindestrich in die Grundform geschrieben wurde. Das Zeichen -i wurde mit einem Bindestrich neben dem Eigennamen geschrieben, es ist also ersichtlich, dass es in ihrem Fall ein Problem mit der Interpretation gab. Es handelt sich hier um ein Problem des Leseverständnisses oder der Unaufmerksamkeit.

Es gab auch Lösungen, bei denen der von ihnen angenommene Bindestrich nur in der Grundform ersetzt wurde, die Wortstruktur aber nicht mehr mit dem Zeichen -i geschrieben wurde. In diesem Fall wurde nur der erste Teil der Aufgabe richtig oder falsch gelöst, der zweite Teil wurde ausgelassen. Dies ist auch ein Problem des Leseverständnisses oder der Unaufmerksamkeit. Bei den anderen war es die mangelnde Kenntnis der Regeln, die zu den falschen Lösungen führte.

Wie aus dem Diagramm ersichtlich ist, war die Zahl der fehlerfreien Lösungen sehr gering, und diese kamen alle von den Studierenden des vierten Studienjahres. Es war aber auch jemand aus dem vierten Studienjahr, der 0 richtige Lösungen hatte. Die Leistungen der Studienanfänger waren homogen: alle erreichten 1 oder 2 Punkte. Insgesamt können also die Leistungen des letzten Jahrgangs als besser, wenn auch nicht als signifikant besser, bezeichnet werden.

Schaubild Nr. 9: Vergleich der Ergebnisse von Aufgabe 15



Quelle: eigene Quelle

Analyse der Aufgabe 19

In dieser Übung mussten die Arten von Nebensätzen identifiziert werden. Die Aufgabe lautete wie folgt:

Milyen típusú mellérendelés van az alábbi mondatokban?
(Welche Art von Nebensatz wird in den folgenden Sätzen verwendet?)

A) Vagy a nagymamámhoz megyek, vagy a barátomat látogatom meg.
(Ich fahre entweder zu meiner Großmutter oder besuche meinen Freund.)

B) Akár a kisboltba is mehetsz, akár a bevásárlóközpontban is megvehetsz mindent.
(Du kannst entweder in den Supermarkt gehen oder alles im Einkaufszentrum kaufen.)

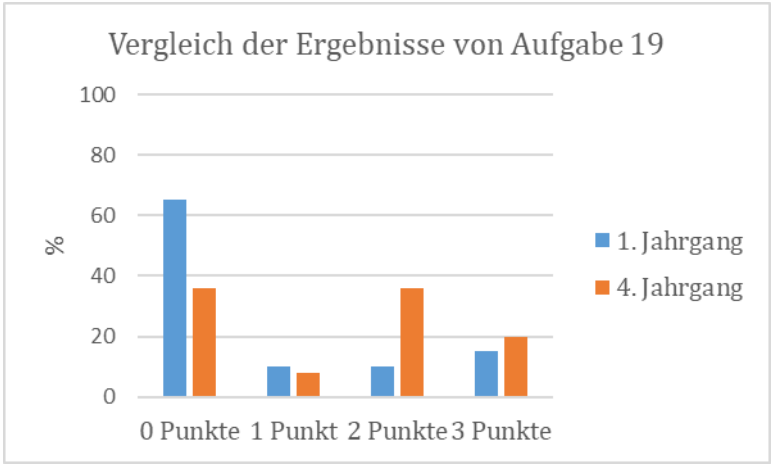
C) Nem sikerült a vizsgám, ugyanis nem tudtam felkészülni.
(Ich habe meine Prüfung nicht bestanden, weil ich mich nicht vorbereiten konnte.)

Obwohl keiner der drei Sätze besonders schwierig war und alle eine typische Konjunktion enthielten, die die Art der Parataxis klar definierte, bereitete diese Aufgabe den Studierenden die meisten Probleme. Die meisten derjenigen, die 0 Punkte erreichten, haben die Aufgabe überhaupt nicht gelöst. Wir vermuten, dass der Grund dafür ein Mangel an Wissen sein könnte: Sie erinnerten sich nicht an die Arten von nebenordnenden zusammengesetzten Sätzen oder sie hatten sie vergessen.

Es gab auch einige, die Probleme mit der Interpretation der Aufgabe hatten, weil sie neben den einen Satz "unterordnend" und neben den anderen "nebenordnend" schrieben, obwohl aus dem Text klar hervorgeht, dass jeder Satz nebenordnend ist. Auch bei dieser Aufgabe schnitten die Studierende des vierten Studienjahres deutlich besser ab.

Es sollte auch erwähnt werden, dass dies das einzige Thema war, das nicht in den Lehrplan der ersten sechs Klassen aufgenommen wurde, sondern nur in der 7. und 8. Klasse. Dennoch wählten wir es als Material für unsere Untersuchung aus, weil diese Aufgabe durch die Kombination von Ungarisch und Mathematik nur logisches Denken erforderte: Aufgabe a) beinhaltete eine ausschließende Wahl, Aufgabe b) eine erlaubende Wahl und Aufgabe c) eine erklärende Nebenordnung.

Schaubild Nr. 10: Vergleich der Ergebnisse von Aufgabe 19



Quelle: eigene Quelle

Analyse der Aufgabe 20

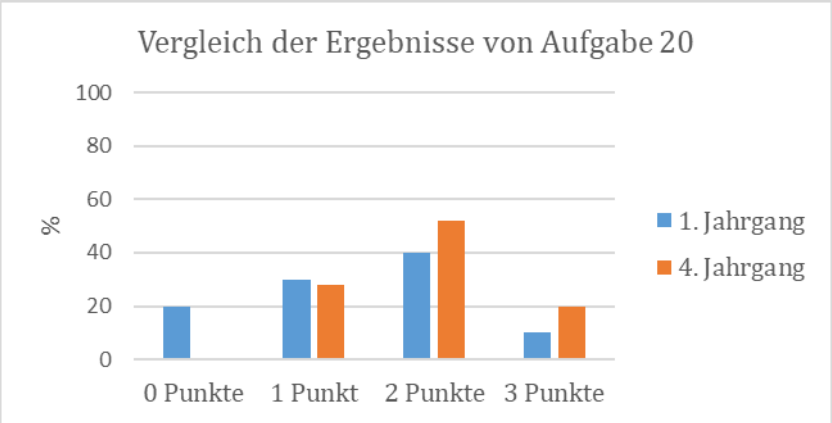
Dies war die Aufgabe der Interpretation von Redewendungen. Die Aufgabe lautete wie folgt:

Az alábbi szólások kifejezhetők egyetlen melléknévvel? Mi a megoldás?
(Können die folgenden Redewendungen durch ein einziges Adjektiv ausgedrückt werden? Was ist die Lösung?)

- *Dagad a szíve a boldogságtól. (Sein Herz schwillt vor Glück.)*
- *Olyan, mint a vasék. (Er ist so, wie ein Stück Eisen.)*
- *Megette a kenyere javát. (Er hat das meiste seines Brotanteils gegessen.)*

Da die ungarische Sprache reich an Wörtern und Ausdrücken mit verwandten Bedeutungen ist, gab es in allen drei Fällen mehrere gute Lösungen, die alle akzeptiert wurden. Die Aufgabe schien nicht schwierig zu sein, dennoch gab es bei den Studierenden des ersten Studienjahres eine überraschende Anzahl von 0-Punkte-Lösungen. Typische Fehler kamen beim Teil (c) der Aufgabe vor. In vielen Fällen wurde hier überhaupt keine Antwort geschrieben, bzw. viele interpretierten die Redewendung mit "er war hungrig". Unserer Meinung nach deutet leider dies auf einen sehr geringen Wortschatz und einen großen Mangel an Lese- und Schreibkenntnissen hin, da viele Volksmärchen diese Redewendung, bzw. diesen Ausdruck als Synonym für das Wort alt verwenden.

Schaubild Nr. 11: Vergleich der Ergebnisse von Aufgabe 20



Quelle: eigene Quelle

Prüfung der Hypothesen

Um die oben genannten Hypothesen zu beweisen oder zu widerlegen, wurde ein T-Test mit zwei Stichproben durchgeführt. Die numerischen Ergebnisse sind nachstehend aufgeführt.

Ergebnisse der Hypothesenprüfung

Zum Vergleich der beiden Stichproben wurde ein T-Test mit zwei Stichproben durchgeführt. Um die Daten vergleichen zu können, mussten wir sicherstellen, dass die Varianzen der beiden Stichproben gleich sind und sich nicht signifikant unterscheiden. Dies wurde mittels eines F-Tests geprüft. Jeder Test wurde mit einem Signifikanzniveau von 5% geprüft. Pädagogische Tests akzeptieren Ergebnisse auf diesem Vertrauensniveau.

Die Ergebnisse sind in der folgenden Tabelle aufgeführt. Da das Forschungsmuster 20 und 25 Items betrug, haben wir die Freiheitsgrade für jeden Test berechnet und die Werte in den Tabellen zum Vergleich herangezogen.

Tabelle 3: Ergebnis der Hypothesenprüfung

	I. Jahrgang			IV. Jahrgang		
	Durchschnitt	Streuung	Muster	Durchschnitt	Streuung	Muster
gesamt	43,0	4,7	20	48,2	4,0	25
Mathematik	24,7	3,4	20	28,0	2,7	25
Ungarisch	18,2	3,2	20	21,4	4,1	25

Quelle: eigene Quelle

Tabelle 4: Ergebnis der Hypothesenprüfung

	F-Probe	$F_{Tabelle.}$	Ergebnis	t-Probe	$t_{Tabelle.}$	Ergebnis
gesamt	1,38	2,03	Varianz unterscheidet sich nicht	3,1	1,684	signifikanter Unterschied
Mathematik	1,58	2,03	Varianz unterscheidet sich nicht	3,6	1,684	signifikanter Unterschied
Ungarisch	1,64	2,11	Varianz unterscheidet sich nicht	2,87	1.684	signifikanter Unterschied

Quelle: eigene Quelle

Die Varianzanalyse ergab, dass sich die beiden Proben nicht signifikant unterscheiden. Deswegen konnten wir den T-Test für zwei Stichproben verwenden. Die Zahlen zeigen, dass sich die Ergebnisse der Studierenden im vierten Studienjahr in allen Fällen signifikant von denen der Studierenden im ersten Studienjahr unterscheiden, und zwar sowohl bezüglich der Gesamtdaten als auch der einzelnen Fächer betreffend.

Bewertung unserer Hypothesen

Bei der Prüfung unserer Hypothesen sind wir zu folgenden Schlussfolgerungen gekommen.

Unsere erste Hypothese, dass die Studierende im vierten Studienjahr sowohl in Mathematik als auch in Ungarisch besser abschneiden würden als die Studierende im ersten Studienjahr, wurde vollständig bestätigt. Dies geht auch aus den Aggregatstabellen deutlich hervor.

Unsere zweite Hypothese, dass sowohl die Studierende im ersten Studienjahr, als auch die Studierende im vierten Studienjahr in Mathematik besser abschneiden als in Ungarisch, weil die Mathematikaufgaben keine lexikalischen Vorkenntnisse erfordern, die Ungarischaufgaben aber schon, ist, wie die Tabellen zeigen, ebenfalls bewiesen. Der Grund dafür ist in der Tat, dass der mathematische Teil unserer Aufgaben kein Hintergrundwissen erfordert, während es praktisch unmöglich ist, die Aufgaben betreffend ungarischer

Grammatik ohne Hintergrundwissen zu erstellen. Die ungarische Sprache besteht aus Regeln, ohne deren Kenntnis keines der grammatikalischen Probleme gelöst werden kann.

Zusammenfassung der Ergebnisse

Zusammenfassend kann man sagen, dass sich unsere beiden Hypothesen bestätigt haben. Sowohl im ersten als auch im vierten Studienjahr sind die Studierende bei den Grundkompetenzen in Ungarisch und Mathematik im Rückstand. Erfreulich ist jedoch, dass unsere Absolventen in beiden Fächern deutlich bessere Ergebnisse erzielten als ihre frischgebackenen Kommilitonen. Die Studie zeigte, dass Studierende im vierten Studienjahr über ein größeres Wissen und Hintergrundwissen verfügen, während das Vorwissen der Studienanfänger eher unvollständig ist.

Zusammenfassung, Zukunftspläne

In unserer Untersuchung erfassten wir die grundlegenden mathematischen und ungarischen Sprachkompetenzen von Studenten des ersten und vierten Studienjahres der Apáczai Csere János Fakultät für Pädagogik, Human- und Sozialwissenschaften der Széchenyi István Universität. Mit Hilfe einer Reihe von Aufgaben versuchten wir, Antworten auf die Fragen zu finden, ob das Niveau des Sprachgebrauchs mit kognitiven Operationen, dem Leistungsniveau und dem kognitiven Stil zusammenhängt und ob mathematisches Wissen mit grammatikalischem Wissen verbunden ist. Wir versuchten, zwei Hypothesen zu beweisen bzw. zu widerlegen. Unsere Ergebnisse scheinen beide Hypothesen zu unterstützen. Aus Zeit- und Platzmangel werteten wir nicht das gesamte Erhebungsmaterial aus. Es gibt noch eine Reihe von Fragen zu beantworten, aber aus den bisherigen Ergebnissen geht klar hervor, dass unsere Studierende, vor allem die Neuankömmlinge, große Defizite in Mathematik und ungarischer Sprache haben. Es sollte viel mehr Zeit für die Entwicklung ihrer Grundkenntnisse investiert werden. In Anbetracht der Ergebnisse möchten wir unser derzeitiges Curriculum in der Zukunft anpassen, um die Fähigkeiten und Fertigkeiten unserer Studierenden zu entwickeln und um ihnen ein tieferes Wissen zu vermitteln.

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Anhang

Der Zusammenhang zwischen Mathematikkompetenzen und Ungarischkompetenzen

1. Geben Sie die folgende natürliche Zahl an.
   Die fünfte natürliche Zahl ist:

2. Welche Nummer wurde angegeben?
   3 Hunderter + 7 Zehner + 8 Einser =
   7 Hunderter + 4 Einser + 5 Zehner =
   1 Tausender + 4 Zehner + 23 Einser =

3. Schreibe die folgenden römischen Ziffern in arabische Ziffern um.
   LXV =
   MMMDCLXXVII =

4. Onkel Józsi hat in seinem Garten Bohnen gesät. Zuerst wollte er drei, 10 Meter lange Bohnenreihen pflanzen, wofür er einen Sack Saatgut für 450 Forint kaufte. Später beschloss er, die Anzahl der Reihen zu vervierfachen. Wie viele Meter Bohnen hat Onkel Józsi gepflanzt? Wie viel hat es ihn gekostet?

5. Ein U-Boot schwimmt 700 Meter unter dem Wasserspiegel. Der neue Befehl lautet, 200 Meter tiefer zu tauchen. Wie viele Meter muss er aufsteigen, um das 126 Meter tief liegende Objekt zu erreichen?

6. Kati Fekete (Kati Schwarz), Dorka Barna (Dorka Braun) und Emma Fehér (Emma Weiß) treffen sich auf der Straße. „Es ist interessant,", sagt einer von ihnen, "dass wir schwarze, braune und weiße Blusen tragen, aber keiner von uns trägt eine Bluse, die zu ihren Namen passt." Welche jungen Frauen trugen welche Blusen?

7. Markiere die richtigen Aussagen mit „I" und die falschen mit „H"!
   a. Der Würfel hat 8 Ecken.
   b. Der Würfel ist ein flacher Körper.
   c. Ein rechteckiger Körper hat rechteckige Seiten.
   d. Es gibt zwei verschiedene Seiten des Würfels.
   e. Jede Kante eines Rechtecks ist gekrümmt.

8. Henriettes Mutter war 20, als Henriette geboren wurde. In fünf Jahren wird ihre Mutter dreimal so alt, wie ihre Tochter sein. Wie alt ist Henriette jetzt?

9. „Mein Sohn, bring mindestens 5 kg Äpfel mit! Hier sind 1500 Forint." - sagte die Mutter von Peti. Wie viel darf Peti höchstens für ein Kilo Äpfel zahlen?

10. Kati schrieb drei Schularbeiten an einem Tag. Sie erzielte 29 von 40 Punkten in Mathematik, 15 von 24 Punkten in Grammatik und 33 von 50 Punkten in Geografie. Welche Schularbeit war die beste? Welche war die schlimmste?

11. 30 Kinder der Klasse 6. a treffen sich an einem Wintermorgen auf dem Schulhof. 22 Kinder tragen blaue Mäntel, 23 Kinder tragen blaue Mützen, 27 Kinder tragen blaue Schals und 20 Kinder tragen blaue Handschuhe.
    a. Wie viele Kinder haben einen Mantel, der nicht blau ist?
    b. Höchstens wie viele Kinder haben sowohl einen blauen Mantel als auch einen blauen Hut?
    c. Wie viele Kinder gibt es, die sowohl einen blauen Schal als auch einen blauen Handschuh haben?
    d. Wie viele Kinder gibt es wohl, deren Schal und Mütze nicht blau sind?

12. Nummerieren Sie die Wörter in alphabetischer Reihenfolge:
csiga, cérna, cölöp, csikó, Czuczor, cukor

13. Ergänze das fehlende j oder ly in diesen Vogelnamen: bago…, ö…v, für…, papagá…, var…ú, só…om, sirá…, hé…a!

14. Trenne diese Wörter an allen möglichen Stellen: télen, maharadzsa, mechanikus, krumpli, Shakespeare, loccsan!

15. Ergänze gegebenenfalls den fehlenden Bindestrich und schreibe dann die Wörter mit dem Zeichen -i daneben.
a. Dunántúli középhegység
b. Győr Moson Sopron megye
c. Kossuth híd
d. Bakony hegység
e. Fekete tenger

16. Geben Sie die Wortart der angegebenen Wörter an: áll, tolunk, lép, sárga, feketén, magyar!
a. Substantiv:
b. Adjektiv:
c. Verb:

17. Zerlege die gegebenen Wörter in ihre Wortbestandteile (Wortstamm=1, Nachsilbe=2, Zeichen=3, Endung=4)!
a. üthetnétek
b. tudományokkal
c. Legokosabbat

18. Welche Satztypen sind die folgenden?
a. Miért nem jöttél el vasárnap?
b. Bárcsak hamar véget érne ez a nap!
c. Hozd már ide azt a labdát!

19. Welche Art vom Nebensatz wird in den folgenden Sätzen verwendet?
a. Vagy a nagymamámhoz megyek, vagy a barátomat látogatom meg.
b. Akár a kisboltba is mehetsz, akár a bevásárlóközpontban is megvehetsz mindent.
c. Nem sikerült a vizsgám, ugyanis nem tudtam felkészülni.

20. Können die folgenden Redewendungen durch ein einziges Adjektiv ausgedrückt werden? Was ist die Lösung?
a. Dagad a szíve a boldogságtól.
b. Olyan, mint a vasék.
c. Megette a kenyere javát.

21. Welche Lautgesetze gelten für die folgenden Wörter? Schreibe sie an die richtige Stelle!
a. Zusammenschmelzung:
b. ganzheitliche Angleichung:
c. partielle Angleichung:
d. Verkürzung der Konsonanten:
e. Ausfall der Konsonanten:

22. Lesen Sie einen Auszug aus dem Werk „A tölgyfa születésnapja" von Zoltán Zelk:
Végül össze is vesztek, s elszálltak, ki merre látott. De azért másnap hajnalban mind odalopóztak a tölgyfa ágaira, és mind elfújta külön-külön a maga csendes nótáját. Így is jó volt ez. Tetszett a százéves tölgyfának, és megígérte, hogy még száz évig fogja ringatni a madárfészket.
Welches Wort aus dem Text entspricht welchen den folgenden Sätzen?
a. das erste Verb mit einem tiefen Ton:
b. das Verb-Suffix, das getrennt vom Verb geschrieben wird:
c. gebildetes Adjektiv:
d. fünfsilbiges, gemischt klingendes Substantiv:
e. ein Verb, das eine Verschmelzung enthält:

Matematikai és magyar nyelvi kompetencia összefüggései

1. Add meg a következő természetes számot!
Az ötödik természetes szám:

2. Melyik számot adtuk meg?
3 százas + 7 tízes + 8 egyes =
7 százas + 4 egyes + 5 tízes =
1 ezres + 4 tízes + 23 egyes =

3. Írd le a következő római számokat arab számmal!
LXV =
MMMDCLXXVII =

4. Józsi bácsi a kertjébe babot vetett. Először három tízméteres sor babot tervezett, ehhez egy zacskó vetőmagot vett 450 Ft-ért. Később úgy döntött, hogy megnégyszerezi a sorok számát. Hány méter babot ültetett Józsi bácsi? Mennyibe került ez neki?

5. Egy tengeralattjáró 700 méterrel a víz szintje alatt lebeg. Az új parancs szerint 200 m-rel lejjebb kell merülnie. Hány métert emelkedjen ahhoz, hogy a 126 m mélyen lévő tárgyat elérje?

6. Fekete Kati, Barna Dorka és Fehér Emma találkoznak az utcán. Érdekes – szólalt meg az egyik –, hogy fekete, barna és fehér blúzt viselünk, de egyikünk sem a nevének megfelelőt. Melyik hölgy, milyen színű blúzt viselhetett?

7. Jelöld I-vel az igaz és H-val a hamis állításokat!
   a. A kockának 8 csúcsa van.
   b. A kocka síklapú test.
   c. A téglatestnek van téglalap alakú oldala.
   d. A kocka oldalai között létezik két különböző.
   e. A téglatest minden éle görbe.

8. Heni anyukája 20 éves volt, amikor Heni született. Öt év múlva anyukája háromszor annyi idős lesz majd, mint a lánya. Hány éves most Heni?

9. „Kisfiam, hozz legalább 5 kg almát! Tessék 1500 Ft." – szólt Petinek az édesanyja. Peti mennyit adhat legfeljebb az alma kilójáért?

10. Kati három dolgozatot írt egy nap alatt. Matematikából 40 pontból 29-et, nyelvtanból 24 pontból 15-öt, földrajzból pedig 50 pontból 33-at ért el. Melyik dolgozat sikerült a legjobban? Melyik a legrosszabbul?

11. A 30 fős 6. a osztály egy téli reggelen az udvaron találkozik. 22 gyereken kék kabát van, 23 gyereknek kék sapkája, 27 gyereknek kék sálja, 20 gyereknek kék kesztyűje van.
   a. Hány olyan gyerek van, akinek nem kék a kabátja?
   b. Legtöbb hány olyan gyerek lehet, akinek a kabátja és a sapkája is kék?
   c. Legkevesebb hány olyan gyerek lehet, akinek a sálja és a kesztyűje is kék?
   d. Legtöbb hány olyan gyerek lehet, akinek se a sálja, se a sapkája nem kék?

12. Számozással sorold betűrendbe a következő szavakat: csiga, cérna, cölöp, csikó, Czuczor, cukor!

13. Pótold a hiányzó j-t vagy ly-t a madárnevekből: bago…, ö…v, für…, papagá…, var…ú, só…om, sirá…, hé…a!

14. Szótagold (válaszd el) az összes lehetséges helyen a szavakat: télen, maharadzsa, mechanikus, krumpli, Shakespeare, loccsan!

15. Ha kell, pótold a hiányzó kötőjelet, majd írd le a megadott szavakat –i képzővel!
   a. Dunántúli középhegység
   b. Győr Moson Sopron megye
   c. Kossuth híd
   d. Bakony hegység
   e. Fekete tenger

16. Állapítsd meg a megadott szavak szófaját: áll, tolunk, lép, sárga, feketén, magyar!
   a. főnév:
   b. melléknév:
   c. ige:

17. Bontsd szóelemekre a megadott szavakat (szótő=1, képző=2, jel=3, rag=4)!
   a. üthetnétek
   b. tudományokkal
   c. Legokosabbat

18. Állapítsd meg a következő mondatok fajtáját!
   a. Miért nem jöttél el vasárnap?
   b. Bárcsak hamar véget érne ez a nap!
   c. Hozd már ide azt a labdát!

19. Milyen típusú mellérendelés van az alábbi mondatokban?
    a. Vagy a nagymamámhoz megyek, vagy a barátomat látogatom meg.
    b. Akár a kisboltba is mehetsz, akár a bevásárlóközpontban is megvehetsz mindent.
    c. Nem sikerült a vizsgám, ugyanis nem tudtam felkészülni.
20. Az alábbi szólások kifejezhetők egyetlen melléknévvel? Mi a megoldás?
    a. Dagad a szíve a boldogságtól.
    b. Olyan, mint a vasék.
    c. Megette a kenyere javát.
21. Milyen hangtörvények érvényesülnek az alábbi szavakban? Írd őket a megfelelő helyre: azonban, költség, rizspor, álommal, otthon!
    a. összeolvadás:
    b. teljes hasonulás:
    c. részleges hasonulás:
    d. mássalhangzó-rövidülés:
    e. mássalhangzó-kiesés:
22. Olvasd el Zelk Zoltán: A tölgyfa születésnapja c. művének egy részletét!
    Végül össze is vesztek, s elszálltak, ki merre látott. De azért másnap hajnalban mind odalopóztak a tölgyfa ágaira, és mind elfújta külön-külön a maga csendes nótáját. Így is jó volt ez. Tetszett a százéves tölgyfának, és megígérte, hogy még száz évig fogja ringatni a madárfészket.
    Írd ki azt a szót a szövegből, amely megfelel az adott meghatározásnak!
    a. az első mély hangrendű ige:
    b. az igétől külön írt igekötő:
    c. képzett melléknév:
    d. 5 szótagú, vegyes hangrendű főnév:
    e. összeolvadást tartalmazó ige:

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SOME RESULTS OF AN EMPIRICAL STUDY ON THE WILLINGNESS OF UNIVERSITY CITIZENS TO TRANSFER KNOWLEDGE

Abstract

In 2021, a survey was conducted to map the willingness to share knowledge of several students studying at Hungarian universities. The authors of the study wanted to examine how students rate knowledge sharing in the organisation where they study, how open they are to share their knowledge, what informal forms of knowledge sharing exist in the educational institution for academic and non-academic knowledge sharing, with whom they are willing to share their knowledge the most and furthermore what are the most important knowledge transfer problems in their institutions. The respondents filled in a questionnaire during seminars and on the social media platforms. 552 university students participated in the survey. The results show that knowledge sharing is a fundamental feature of the institutional strategy and active knowledge transfer is practised in schools since this is one of the primary tasks of universities, however, it is less common to encourage or reward knowledge sharing. In the study women rated their institution's knowledge management practices stronger than men. Furthermore, the results showed that in institutions where knowledge sharing is an important part of the strategy, there is active knowledge sharing and the more distant the relationship between a student and a student is, the less open they are to sharing information. According to the findings, the closer the relationship is, the more sharing tends to occur within the participants of knowledge transfer. As the issue of knowledge management and knowledge sharing is an inevitable question in corporations' and universities' everyday life, preserving, developing, and transferring knowledge is a primary requirement for the organisations.

Keywords: knowledge transfer; university students; strategy

Literature review

Knowledge sharing is an obvious process in an academic environment such as a university (Dzandu et al., 2014). Knowledge sharing is a process where individuals exchange explicit and tacit knowledge, mutually create new knowledge, and transfer experiences and information (Castaneda & Cuellar, 2021). Knowledge sharing is known as a significant process which helps to build up general knowledge management procedures by being incorporated into both organisational and individual minds to develop their power to learn with the assistance of information technologies. Knowledge sharing is the explicit or implicit knowledge management through which knowledge can be shared, generated, and used (Salloum et al., 2018). Although many benefits of knowledge transfer can be listed, it is not always easy to encourage university students to share knowledge as they are not willing to do so voluntarily. Sie and Wang (2018) stated that knowledge sharing between

students and the university could be promoted by building a conceptual framework that includes a community of practice for university students.

Many researchers investigated the impact of knowledge sharing and collaboration processes (as components of the knowledge management process) on education and educational institutions (Bolisani, 2019). Vătămănescu et al. (2019) emphasised the positive influence of organisational policies in facilitating knowledge sharing and collaboration. Dzandu et al. (2014) investigated the factors influencing the knowledge sharing behaviour of undergraduate students at the University of Ghana. The researchers tested six hypotheses (from cross-sectional data), five of which were supported. Their study revealed a critical relationship between students' knowledge sharing behaviours and both cultural, human, and environmental factors. Ghadirian et al. (2014) examined the knowledge sharing behaviours of students in learning environments. Tan (2015) focused on the influence of knowledge management factors in encouraging knowledge sharing among scholars in research universities and proposed a knowledge management-knowledge sharing-collaboration research model. Sie and Wang (2018) examined the promotion of value co-creation and knowledge sharing between universities and learners. Some researchers focused on collaborative knowledge construction among students (Mayordomo & Onrubia, 2015). Memon et al. (2016) examined the impact of personality traits such as openness to experience and agreeableness on knowledge sharing in the student-instructor relationship. Gurteen (1999) suggested a way of creating a knowledge sharing culture, emphasising the significance of starting knowledge exchange practice at a local level. Sohail and Daud (2009), in their study, identified the measures of knowledge sharing such as knowledge nature; working culture; attitudes of staff; opportunities and motivation to share knowledge. Ozdamli and Cavus (2021) interviewed 69 computer information systems students in Cyrpus and found that they prefer using opportunities provided by technology (microblogging applications, online databases, note-taking applications) to share knowledge. Cabrera and Cabrera (2005) identified crucial people management practices that foster knowledge sharing: work designs that promote collaboration; formalised socialisation programmes and informal social events; a trusting and open culture; information technology that matches organisational culture; development of teamwork skills and capacity to communicate knowledge; and other practices.

Factors influencing knowledge sharing and the willingness of students to share knowledge

There are four main knowledge management factors which are critical for enabling knowledge sharing to occur: individual/personal (trust, knowledge self-efficacy, reciprocity), organisational (top management support, rewards, culture), technological (KM system infrastructure and quality), and face-to-face interaction and open communication (Tan, 2015). Joseph and Jacob (2011) stated that corporate climate and culture are powerful organisational influencing factors. Participants of the research conducted in Innsbruck believe that mutual trust, willingness and motivation on both sides, and an honest and open personality are the most crucial factors that influence the successful integration

of knowledge transfer in an organisation. Referring to other knowledge transfer experiences, aspects such as team spirit, solidarity, open learning culture, and attitude to work also affect the efficient integration of knowledge sharing within an organisation (Schlögl et al., 2018). In the educational sector, influencing factors cover individual, technological, and classroom aspects. Wangpipatwong (2009) claimed that students' ability to share, technological support, and a level of competition with group mates are the factors influencing knowledge sharing. On the other hand, the author stated that instructor support, students' willingness to share, and the availability of technology do not influence knowledge sharing between students. Dzandu et al. (2014) found that the knowledge sharing behaviour of university students is related to environmental and human factors. It is, however, not dependent on the personal characteristics of students. Motivating factors such as normative and community-related considerations and personal benefits define one's willingness to share knowledge with others (Rahman et al., 2014).

Raza et al. (2018) especially focused on the influence of motivation, trust, subjective norms, rewards, and attitudes of students on knowledge sharing behaviour at university. The researchers claimed that a feeling of superiority among others, trust, and motivation increase the willingness of students to share their knowledge with others. Moreover, it has been found that students' attitudes towards knowledge sharing are positive and students are more willing to share knowledge with people they know. Regardless of the importance of knowledge sharing within organisations, attitudes to sharing knowledge may differ. Some people may avoid sharing knowledge as they consider it a risky practice that will lead to their vulnerability (Nugroho, 2012).

The importance and benefits of knowledge sharing

Knowledge sharing is a crucial step and is critical for intellectual discourses (Ghadirian et al., 2014). Sie and Wang (2018) claim that knowledge sharing is an essential part of the learning process in higher education. Previous studies have emphasised the importance of implementation knowledge sharing in universities and organisations (Gurteen, 1999; Rowley, 2000; Sohail & Daud, 2009; Dalkir, 2011; Jones & Sallis, 2013; Dzandu et al., 2014; Mueller, 2015; Javaid, 2020). Cheng et al. (2009) underlined the significance of knowledge sharing in knowledge-based institutions as well as in business organisations. Gurteen (1999) underlined the importance of knowledge sharing, which brings continuous innovation, application of new knowledge, and acceleration of technological, business, and social change.

Knowledge transfer benefits educational institutions and professionals (Salloum et al., 2018). Tan (2016) also described knowledge sharing as the most desired and essential knowledge management process for institutions. Generating innovative ideas, sense of purpose, team building, and not making the same mistakes several times are benefits that are associated with knowledge sharing (Dalkir, 2011). According to Castaneda and Cuellar (2021), knowledge sharing improves the quality of interpersonal relationships, academic achievement, and people's attitudes toward working with others.

Obstacles to sharing knowledge

There are numerous barriers that can hinder the knowledge sharing process in organisations. One of them is the belief that knowledge is a property, and its ownership is essential. Another reason is the uncertainty of the provider about the receiver's understanding and use of knowledge (Dalkir, 2011). Sun and Scott (2005) investigated barriers to knowledge transfer and mentioned fourteen sources that participants in their study agreed on (for instance, individual imperatives, competencies, organisational climate, team relationships, inter-organizational relationships, and other sources). Riege (2005), in his article, reviewed and discussed more than thirty barriers to knowledge sharing by dividing them into three categories: individual, technological, and organisational. Personal or individual factors are lack of social networks and communication skills, overemphasising position status, and cultural differences. Technological factors can be defined as unwillingness to use applications, lack of technology integration and unrealistic expectations of information technology systems. Organisational barriers are lack of infrastructure and resources, and the accessibility of informal and formal meeting spaces. After examining the barriers to knowledge sharing and its effectiveness in Vietnamese higher education institutions, Van Ta and Zyngier (2018) identified three main factors: poor knowledge management, bureaucratic management, which causes a lack of autonomy in decision-making, and weak personal absorptive capacity.

Formal and informal knowledge sharing

Informal knowledge sharing is a process where individuals or group members share, accept information, knowledge, and ideas informally (Nugroho, 2012). Formal knowledge sharing practices include training programs and technology-based systems and are designed to acquire knowledge explicitly, while informal knowledge sharing opportunities incorporate social networks and personal relationships (Ipe, 2003). Ipe (2003) also stated that more knowledge is shared in the informal context and that the process depends on the culture of the organisation. On the other hand, Bencsik et al. (2019) found that members of organisations are more likely to share professional information in a formal context than in private. Nevertheless, informal knowledge-sharing activities, which have no positive effect, such as gossiping, are also popular within organisations. Mueller (2015) investigated formal (training programs and workshops, reports, flagship projects) and informal (meeting by chance, learning from someone's experience, talking with people in elevators or coffee rooms) knowledge sharing practices between project teams. The author also stated that formal practices can facilitate the development of informal practices.

Research methodology and results

In 2021, the authors organised a study to investigate the willingness to share knowledge of several students studying at Budapest Business School. The research ran from January 2021 to October 2021. Students could fill in the questionnaire in class, or other students on campus could fill it in using the snowball method. The largest pro-

portion of students in the analysis were from Budapest (85%), while the smallest proportions of students were from South Transdanubia and Central Transdanubia (0.7% and 0.5% respectively).

During the survey, respondents filled in a questionnaire prepared in advance by the authors during seminars and on the social media platform. Responses were voluntary and anonymous, which the research organisers informed the participants about. Furthermore, the researchers followed the university's ethical code of conduct for ethical research.

A test survey was also organised by the authors of the study before the questionnaire was sent out. Three respondents were asked to fill in the questionnaire, but as there were no problems of interpretability for the respondents, it was posted on the Internet in its unchanged form. The research participants had to answer 27 questions, of which 26 were closed questions and one was open. The questions were typically based on nominal and metric variables.

The questions were divided into several groups of questions, the structure of which is presented in Table 1:

Table 1: The structure of the questionnaire

1st group of questions: Specific questions	2nd group of questions: Ability to cooperate	3rd group of questions: Feedback in specific situations	4th group of questions: Problems of knowledge transfer
Gender of the respondent Age of the respondent Place of residence What subject are you studying? How old is the student? Reasons for choice of institution?	Opportunities for cooperation between institutional citizens Sharing information in different situations (with friends, acquaintances, strangers) With whom do university citizens share information? Informal knowledge sharing arenas in universities?	How do you get back information in each situation? What are the expectations between knowledge sharing participants in each situation?	What problems arise in the transfer of knowledge between university citizens? What are the reasons?

Source: own table

552 people participated in the survey. Responses were analysed using univariate and multivariate data analysis methods using SPSS version 28. These included: frequency tests, analyses of means, ANOVA, T test, correlation analysis.

In the analysis, the authors of the study have set several objectives, and in the present study they have sought to answer the following:

- How do students rate knowledge sharing in the organisation where they study?
- How open are students to each other and teachers to students about knowledge sharing?
- What informal forms of knowledge sharing exist in the educational institution for academic and non-academic knowledge sharing?
- With whom are students willing to share their knowledge?

- What are the most important knowledge transfer problems in the institution where they study?

With these research objectives in mind, the researchers in the present analysis examine the validity of the following two hypotheses:

Hypotheses

H1) The students participating in the research are satisfied with the knowledge transfer practices in the institution, although their perception of the processes depends on the gender of the students and the year in which they study.

H2) In the examined educational institution, informal forms of knowledge transfer play a greater role in the transfer of academic knowledge than in the transfer of non-academic knowledge.

In the study, the authors used the following sample:

Table 2: The specification of the sample (N=552, %)

Specification	Frequency (%)
Gender	45.5% Male 54.5% Female
Field of science that the student is studying	3.5% Health science 4.5% Natural sciences 8.6% Engineering 76.5% Economics 3.4% Humanities 0.6% Arts 1.3% Law 1.5% Pedagogical science 0.2% Humanities
Which academic year the student is in	32.4%First year 18.8% Second year 20.5% Third year 10.0% Fourth year 2.2% Fifth year 16.1% Other (e.g. PhD, second degree, etc.)
Where is the higher education institution where the student is studying?	85% in Budapest 1.8% in Northern Great Plain 2.7% in Southern Great Plain 5.3% in Central Hungary 0.5% in Central Transdanubia 1.6% in Western Transdanubia 0.7% in South Transdanubia 2.4% in Northern Hungary

Source: own table

The average age of respondents was 24.17 years. The sample specification shows that a higher proportion of women were present in the sample. Most of the students in the survey were studying economics, and they were typically studying for a BSc.

In the research, the authors first asked how the students evaluated their own institution's knowledge management practices. They were asked to indicate on a five-point Likert scale how typical the statement was of their own institution. A one indicated not at all typical and a five indicated completely typical. The mean and standard deviation of the responses are shown in Table 3:

Table 3: What are the characteristics of the knowledge management practices of the educational institution? (mean, standard deviation) (N=552)

Characteristics	Mean	Deviation
Knowledge sharing is rewarded in the organisation.	3.38	1.109
Knowledge sharing is encouraged in the organisation.	3.93	0.931
The organisation has tools to support knowledge sharing.	4.07	0.852
The organisation has active knowledge transfer.	4.08	0.853
Knowledge sharing plays a significant role in the organisation's strategy.	4.11	0.869

Source: own table

The results show that knowledge sharing is a fundamental feature of the institutional strategy and is felt by the students. It is no coincidence that active knowledge transfer is therefore also practised in schools since this is one of the primary tasks of universities. However, it is less common for schools to encourage or reward knowledge sharing. These were the questions with the highest scatter, which also shows that respondents were the least unanimous.

The authors examined how women and men perceived these statements, and whether students in different grades held different views on the issue.

For gender, the independent samples T test showed no significant difference. It is however true that, apart from a claim of rewarding knowledge sharing, women rated their institution's knowledge management practices stronger than men.

In terms of years the ANOVA test, already showed a complete difference for all the statements in Table 3. In all cases, students felt the statements more strongly in the first two years, then in the third and fourth years there was a decline in the strength of the knowledge strategy, and then in the fifth year and PhD students again showed a strengthening in their positive perception of the institutions' willingness to share knowledge, strategy, and tools.

The authors also examined the statements in Table 3 in terms of how they relate to each other. The correlation analyses showed that in institutions where knowledge sharing is an important part of the strategy, there is active knowledge sharing (r: .730 p: .001) and a strong supportive instrument (r: .586 p: .001). In schools where knowledge sharing is encouraged, knowledge sharing is typically rewarded (r: .63 sig.: .001). In schools where knowledge sharing is reinforced, knowledge sharing plays a significant role (r: .501 sig.: .001) and active knowledge sharing is also in place (r: .583 sig.: .001).

The study also revealed which students are more open to sharing information with other students. Here again, respondents were asked to rate the options on a five-point Likert scale. One meant no at all, while five meant yes. The mean and variance of the responses are summarised in Table 4:

Table 4: Which students are open with you about sharing information? (mean, standard deviation) (N=552)

Characteristics	Mean	Deviation
Close friends in the institution.	4.61	0.814
Your own group mates.	4.28	0.866
Students in neighbouring groups.	3.35	1.018
Upper year students.	3.26	1.125
Lower year students.	2.71	1.249

Source: own table

The table shows that the more distant the relationship between a student and a student is, the less open they are to sharing information. The standard deviation values also increase in this direction, so that the respondents' opinions on these issues are more divergent from the average.

The independent samples T-test for gender showed a significant difference for only one variable, and that is immediate friends (t: -2.656 $p<0.05$). Men think that their friends are more willing to share information (mean: 4.52) than women think (mean: 4.70).

When looking at the year groups, it was confirmed that only the lower years were different for students in different years (F: 2.028 df: 8 s.p.: .041 $p<0.05$). For this group of students, when looking at the averages, the more time one spends within the university walls, the more likely one is to believe that the lower years are more open to passing on information to them. This may reflect a respect for the upper years, which may also motivate newcomers to share knowledge.

Like the openness of students to information, the authors also looked at how students perceive the willingness of teachers in a particular institution to share their knowledge with students. Here again, the authors used a Likert scale of five. A one meant not at all, a five meant yes. The mean and variance of the responses are presented in the table below:

Table 5: Which lecturers are more open with you about sharing information? (mean, standard deviation)(N=552)

Characteristics	Mean	Deviation
Lecturers directly teaching you.	4.63	0.756
Lecturers from other groups, but they know you.	3.73	1.093
Lecturers who do not teach you at all and do not know you.	2.91	1.253

Source: own table

As with student relationships, the relationship between the learner and the teacher has a strong influence on the willingness to transfer knowledge. The closer the relationship is, the more sharing tends to occur. When the independent samples T-test was tested by gender, all three variables were significantly different for women and men. Women perceive direct instructors (mean:4.68) to be more open than men. However, men were more strongly than women

in believing that instructors from other groups (mean:3.84) and foreign teachers (mean:3.07) are willing to share their knowledge with students.

Only for direct instructors did the year groups differ in their opinions (F: 2.426 df: 8 s.p.: 0.014 $p<0.05$). Here, the opinion of first-year students was strongest (mean: 4.75), compared, for example, with fourth-year students (mean: 4.31) or fifth-year students (mean: 4. 58). It is likely that this response may reflect the fact that upper-year students already have more experience in judging the willingness of teachers to teach than students who have left high school and are in their first year of university.

The students had to assess the instructors' willingness to transfer knowledge in different situations. A one was weak and a five was strong. Table 6 shows the mean and standard deviation results:

Table 6: How does the instructor share knowledge in the following situations? (mean, standard deviation)(N=552)

Situations	Mean	Deviation
Transfer of supplementary materials.	3.94	0.923
Sharing up-to-date information.	4.03	0.955
Transfer of practical knowledge.	4.18	0.938
Delivery of compulsory curriculum.	4.31	0.871
Sharing exam dates.	4.38	0.851
Sharing requirements.	4.39	0.843

Source: own table

It can be concluded that the students surveyed are satisfied with the knowledge sharing of teachers at their university. The low value of the standard deviations also confirms that there is unanimity among students.

In terms of gender, they differ in their perception of the knowledge sharing of instructors in terms of sharing requirements (t: -2.616 $p<0.05$) and exam dates (t: -2.637 $p<0.05$). In both situations, women perceive instructors' willingness to share as stronger. A significant difference was identified when looking at all situations in terms of year groups. The first and fifth years felt the strongest in terms of teachers' willingness to share knowledge. Table 7 summarises the ANOVA results and the authors have indicated which year groups felt the strongest teacher knowledge sharing in each situation.

Table 7: Assessment of teachers' knowledge sharing by grade (ANOVA, p=0.05, N=552)

Situations	ANOVA	Which grade rates as the strongest? (average)
Transfer of supplementary materials.	F: 1.649 sign.: 0.049	Fifth-year student (4.17)
Sharing up-to-date information.	F: 2.832 sign.: 0.004	First-year student (4.17)
Transfer of practical knowledge.	F: 4.299 sign.: 0.000	First-year student (4.45)
Transfer of compulsory curriculum.	F: 4.213 sign.: 0.000	Fifth-year student (4.67)
Sharing exam dates.	F: 3.816 sign.: 0.000	Fifth-year student (4.67)
Sharing requirements.	F: 2.793 sign.: 0.005	Fifth-year student (4.67)

Source: own table

The authors also reviewed whether there is a link between the knowledge management system of the institutions and the openness of the teachers to knowledge sharing. Based on the correlation studies, the authors were able to draw the following conclusions:

- In organisations where knowledge sharing is an important part of the organisation's strategy, there is a strong tendency for trainers to share requirements (r: .552) and to transfer practical knowledge (r: .458).
- In organisations where there is active knowledge sharing, there is strong sharing of requirements (r: .450), sharing of compulsory learning (r: .423) and transfer of practical knowledge (r: .461).
- In organisations where knowledge sharing is rewarded, there is a strong preference for sharing up-to-date information (r: .284) and transferring practical knowledge (r: .404).

Overall, students are satisfied with the institutions' knowledge transfer processes, but satisfaction is influenced by the gender of the respondent and the year of study. On this basis, the authors accept their first hypothesis.

The studies also sought to shed light on the role of informal forms of knowledge transfer in the transfer of academic and non-academic knowledge. Respondents were asked to give their opinion on the specific forms of knowledge transfer and how characteristic they were for the type of knowledge they were given. One was not at all typical and five was completely typical:

Table 8: Informal knowledge transfer forms for academic and non-academic knowledge (mean, standard deviation) (N=552)

	Academic knowledge		Non-academic knowledge	
Forms	Mean	Deviation	Mean	Deviation
Educational lessons	4.20	1.019	2.66	1.260
School canteen	2.41	1.216	3.01	1.321
Lunch with students during the day.	2.48	1.205	3.09	1.338
Having coffee and smoking with students.	2.83	1.322	3.27	1.346
Trips with students	2.60	1.250	3.05	1.379
Community portals.	3.91	1.100	3.57	1.276
Through intranet	3.49	1.355	3.07	1.456
At institutional events	2.63	1.266	2.64	1.306
Through video sharing portal	2.88	1.342	2.41	1.317

Source: own table

The main platform for learning knowledge is the classroom and the community portal. While non-study related knowledge is mostly shared in community spaces such as the community portal, the cafeteria, over coffee and lunch. In those forms where students are freer to let go, there is a greater emphasis on non-study knowledge, while in more bounded settings, study knowledge is more prevalent.

Depending on the number of years of study, different forms of learning are preferred. Regardless of the year in which a student is studying, the main field of knowledge transfer is the

classroom. First-years prefer to use a community portal (mean: 4.11), but fifth years also use the school canteen (mean: 3.08), while the same cohort is less likely to share learning while travelling (mean: 1.67). Second, third and fourth years use community portals and intranets, but less so the school

canteen. For non-academic knowledge, the school canteen plays a more significant role for all grades, especially for fourth years (mean: 3.49). At lunches, fourth (mean: 3.49) and third years (mean: 3.17) talk about non-school-related topics.

The analysis also revealed that for some types of information there is a link between different forums. The analyses showed that during lunches, during intranet sessions, at institutional events and on the video-sharing portal, not only professional but also non-academic topics are raised among students in parallel.

Finally, the research asked what the most important problems are related to knowledge transfer in students' institutions. Here the authors focused primarily on academic knowledge. Almost a third of the respondents (30.3%) mentioned that students do not ask questions because they are afraid of being found out not to have enough information, many mentioned a lack of motivation on the part of students (16.3%) or a lack of time to transfer knowledge effectively (14.3%).

In conclusion, there are different forums for knowledge sharing depending on whether it is professional or non-professional knowledge transfer, but that these forums play a significant role for both types of knowledge, and the authors cannot accept their second hypothesis.

Summary

The study presented some of the results of research carried out last year. In the light of the results, knowledge sharing is a fundamental feature of the examined university's institutional strategy, but it is less common for the institutions to encourage or reward knowledge sharing. Students are satisfied with the institutions' knowledge transfer process and students are willing to share their knowledge, but satisfaction is influenced by the gender of the respondent and the year of their study. This is in line with the results of other international and national studies.

Moreover, the results showed that the more distant the relationship between a student and a student is, the less open they are to sharing information. As far as student relationships are concerned, the relationship between the learner and the teacher has a strong influence on the willingness to transfer knowledge, which means the closer the relationship is, the more sharing occurs. There are several forums for knowledge transfer provided by universities, which play a significant role in the knowledge management practices of institutions, regardless of the content of the knowledge.

The results of the study, although not representative, provide information on the willingness to transfer knowledge and on what informal forms of knowledge sharing exist in the educational institution for academic and non-academic knowledge sharing at the examined universities. The results of the study justify the need for further research to understand and map the organisational knowledge sharing practice in our country.

The researchers want to continue their research in the future. Firstly, they want to investigate at international level whether cultural differences influence students' willingness to share knowledge. On the other hand, it would be an interesting approach to look at the question for

students who are specifically facing state exams. How willing they are to share valuable information such as elaborated lists of items, or to collaborate on items. This is also an important question because after the state exams, students need to practice and implement active knowledge sharing in the world of work.

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LEARN, UNLEARN, RELEARN — THE NEW WAY OF LEARNING IS CALLED MEDIA AND INFORMATION LITERACY

Abstract
Media and information literacy is a key competency in the 21st century knowledge societies. It is much more than just knowing to use the digital technology. The media and information literate person knows how to learn, how knowledge is organized, and how to find, select, evaluate, organize and use information. The Institute of Library and Information Science at the University of Pécs made an online survey in 2014 about information competencies of university students all over Hungary. The aim of the survey was to get information about students' information searching strategies, favourite resources, information seeking, selection and evaluation methods, and to base a new information literacy strategy. The results of this survey, compared with other surveys, show that during their studies students get a lot of assignments for which they need to find relevant information and literature, and analyzing them articulate a personal view about the problem. The biggest challenge for the new generation is the evaluation and selection of information. They don't know how to make considered decisions, and very often they don't even feel why this is important. That's why it is crucial to develop special, professional information literacy competencies of students more efficiently. There is a special emphasis to be placed on the role of libraries, since they are the institutions that play a major role in the acquisition and development of information literacy. At the same time, this situation poses a serious challenge for libraries that they need to prepare for. There are international programs and projects that can help libraries in this endeavour.

Keywords: media and information literacy; education; libraries

Introduction

"The new education must teach the individual how to classify and reclassify information, how to evaluate its veracity, how to change categories when necessary, how to move from the concrete to the abstract and back, how to look at problems from a new direction—how to teach himself. Tomorrow's illiterate will not be the man who can't read; he will be the man who has not learned how to learn." (Toffler, 1970, p. 211).

This statement of Alvin Toffler is a very good motto, if we are thinking about the future of learning. He said this in 1970, 52 years ago, and it is still valid, or even more valid than ever. Living in a world of manipulation and fake news, where information is the main energy, but achieving and understanding it needs special skills, where new generations sometimes know more than their parents, we need this quotation to understand the future of learning.

Theoretical foundations

Since the mid-20th century technology, economics and culture and their effect on each other have been rapidly changing. People need to adapt continuously to the changing environments, equipment, conditions and opportunities. The question is how this is to be done - how to face constant challenges, and what skills, abilities and competencies are needed to be able to progress in the information society and the digital world.

As we go deeper and deeper into the information society, we find always new ways to the information. Media, new media, Internet, web 2.0 (even web 3.0), social media etc. are totally transforming our habits of getting new information. Young people get the latest news not from the newspapers, but from Facebook, Insta, Tiktok, blogs and comments, the main ways of opinion forming are the forums, where one can be involved in discussions with not known people. The most important sources of information are not the books and the media, but the people. If a young person wants to learn how to do something, he/she looks for a YouTube video instead of reading some guidelines.

Parents and teachers like to blame young generations because they do not read. We must go deeper in this question: What are the reading habits of the new generations? Do they really read less, or only in a different way? If we are honest, we have to confess ourselves: Our children are reading a lot, maybe more than we, but they read different things on a different way than we are used to. They read messages, Facebook, Twitter, Insta, homepages, computer games etc. They get an enormous amount of information in a very short time. The problem is that they don't know what to do with this information. It is our task to teach them how to select and evaluate the information, how to find the really important points, how to find the value. It is something very different than just to teach them how to read. This is a new way of learning, this is media and information literacy.

The concept of media and information literacy

The notion of literacy is going through a significant paradigm shift in knowledge-based societies. It includes knowing the basics of the national culture, being well-informed, behaviour standards, digital competences and also the skills of applying knowledge learned. Educated people have extensive knowledge because they have accessed a lot of information – they have formed their knowledge by selecting, organising and integrating all this information. They are able to mobilize and use the information they learned. Thus literacy is not only about being well-educated and well-read but also includes the skill of being able to select from the wealth of information and manage it. The current interpretation of literacy places emphasis on the ability to navigate in the information environment of the 21st century. According to Toffler the illiterate of the 21st century will not be those who cannot read or write, but those who cannot learn, unlearn and relearn (Toffler, 1970).

The meaning of the term literacy is constantly changing in different cultures. In English culture it has a strong and stable meaning, but for example in Eastern and Central Europe the term has a controversial life (Varga, 2013). In most European countries people don't like to mix the traditional literacies and cultures with the modern digital competencies.

There are strong debates around the terms: literacy, competency, information, digital etc. (Koltay & Varga, 2013).

Information literacy is not a new topic, especially in the field of library and information science, but in Eastern-European countries it is not really manifest in public education and higher education programs. Education policy makers are dealing only with the problems of digital literacy, and do not want to take into consideration, that it is necessary to have much broader information competencies in order to survive in the 21st century. "Finding and using information is exponentially more complex than it was a generation ago as the information landscape has shifted from one of scarcity of resources to abundance and overload." (Head, 2013, p. 473.)

One of the main challenges of current day education is to teach students to succeed in a world reliant on information and technology. Today's students find it much easier to use modern technology and devices than their parents. They do not only acquire knowledge from their teachers and textbooks but also from a wide range of information sources. However, it is still our task to teach them how to think, assess and select. One of the most important goals of upper-secondary education is to encourage students to think, plan and work in a purposeful way, make informed choices and assess information critically. It also aims at preparing them for 21st century workplaces and successful higher education studies. Fast-changing information and technical environments require increasingly more advanced skills in terms of navigation, assessment and information usage – and teachers and textbooks have a key role in supporting students with developing these skills (Partnership for 21st century skills, 2019).

No matter how the technical devices of information transmission and opportunities for accessing information are changing, effective learning and work continues to be based on a high level of reading literacy. Research shows that while there have been profound changes in the field of digital information in the past 20 years, requirements related to understanding basic information at workplaces have not changed (Catts, 2012). However, work processes have undergone considerable changes: there are more and more jobs where employees do not only execute tasks but also participate in producing knowledge. Therefore in order to succeed in the labour market one needs complex information literacy skills.

Media and information literacy is obviously the basic skill of the 21st century. It includes the competences and knowledge required for finding one's way in knowledge-based society, selecting information responsibly and competently and create new one. It includes skills that are important in all areas of life such as learning, research, manufacturing and leisure (realising the need for information, search for information, selecting, interpreting, critical thinking, the creative usage of new information etc.). These specific 21st century skills should be treated both in a uniform and differentiated way. According to the Alexandria Proclamation adopted by UNESCO in 2005, media and information literacy is essential for achieving one's personal, social, occupational and educational goals. These skills are necessary for lifelong learning and becoming an efficient member of knowledge-based society (Beacons, 2005).

The Information for All Programme (IFAP) of UNESCO regards media and information literacy as a human right (UNESCO, n.d.). Along with problem solving and communication skills, it is used as an element of an integrated set of skills, vital for efficient operation in all areas of life. If handled separately from other adult competences, it sheds light on a specific dimension to complex skills and makes it possible to differentiate between the efficient usage of information as well as accessing and acquiring information. The global project of OECD on the assessment of social progress reveals that complex information literacy enables people to terminate dependency from information brokers (experts selling selected information) and become real "knowledge accumulators". This competence provides one with knowledge and attitude that protect someone from the negative, harmful effects of information.

There is no widespread agreement on the definition. Some think that certain elements of this complex skill set are also included in other categories (e.g. information search skill, reading comprehension skill, problem solving, creativity etc.) and thus do not deem it necessary to create a new term. Others think that it is digital literacy that differentiates media and information literacy from general literacy and therefore it should be addressed separately. Essentially, addressing, teaching and developing these skills, knowledge and literacy elements together, in a unified system are qualitatively different from addressing them one by one. It is not only about knowledge and skills but also attitudes and approaches. Not only the idea of digital literacy must find its place among information literacy, computer literacy, ICT literacy, e-literacy, network literacy, and media literacy, but it must also be matched against terms which avoid the "literacy" idea, such as informacy and information fluency. Indeed, in some cases, mention of information or anything similar is avoided—particularly in workplace settings—as in "basic skills," "Internet savvy," or "smart working. (Robinson et al., 2005)

In Hungary, the digital pillars of information society have not been adequately considered as a complex entity, the structured foundation and the development of information literacy have not been achieved. One reason for this is that the concept of information literacy still has not taken root. It is neither part of education policy, nor of normative documents in regard to public, higher and adult education. The complex foundation and the development of information literacy are not prioritized within the goals of public and higher education; therefore, information literacy has not had a chance to take a hold in educational practices. The first task is the complex interpretation of the concept of information literacy, which will allow for the term to become more prevalent, and it would also facilitate implementing it in practice (Egervári, 2014).

Media and information literacy may be considered an umbrella term or a threshold term. As an umbrella term, it includes all literacies needed by today's individuals: traditional literacy, digital literacy, library literacy, internet usage, critical thinking, media literacy, information ethics etc. According to another approach, it can be interpreted as a threshold term, mastering which gives access to acquiring knowledge. By mastering complex information literacy (as a threshold term), learners understand that information has value attached to it, science is a dialogue, research is asking questions, authority depends

on context, producing information is a process and information search requires strategic thinking (The Association of College and Research Libraries, 2015).

Media and information literacy is built on several literacies but it is not identical to them. It is often confused with digital literacy or media literacy.

- Computer/digital literacy: a set of skills and knowledge essential for understanding information and communication technologies, including the knowledge of hardware, software, systems, networks, the Internet and other ICT elements.
- Media literacy: a set of skills and knowledge essential for understanding the channels and forms data, information and knowledge can take, how they are produced, stored, transmitted and presented (e.g. the press, radio, TV, CD-ROM, DVD, mobile phones, PDF, JPEG etc.).

However, media and information literacy is a more complex term. It is a set of skills enabling people to realize their need for information, to search for, assess and efficiently use information, including of course the usage of digital technology and media. These competences are increasingly important in fast-changing technical environments and exponentially increasing information sources.

Metaliteracy and transliteracy are new terms emerging in literature. The first focuses on skills information users use for actively producing and sharing contents on social media and online community platforms – that is, they are active participants of knowledge-based society, not only as consumers but also as producers of information. Transliteracy implies that media and information literacy also involves transition between various information platforms and formats i.e. the continuous modification and transformation of information. These tendencies indicate that the complexity of the term requires a multi-perspective approach (Karvalics, 2012).

Considering skills and competences, a media and information literate person is able to:

- define his/her need for information,
- obtain the necessary information efficiently and effectively,
- critically assess the information and its sources,
- integrate the selected information into his/her knowledge base,
- efficiently use the information for achieving specific goals,
- understand economic, social and legal issues related to information usage and use information lawfully and ethically.

The above skills and activities do not develop linearly, one after the other, but are interconnected. It is possible that someone obtains information, realises its usefulness and uses it but only later acknowledges the value of the information source.

According to constructivist learning theory, learners are to find out the solutions to problems by using information; they are to arrive at new conclusions through active research and thinking – and this is more important than memorising facts and data presented in the classroom. Such pedagogical approach enables students to become competent learners. Thus media and information literacy has to be based on source-based learn-

ing, independent exploration and problem-based learning. It requires pedagogical sophistication, giving opportunities to students to experience as many learning styles as possible.

Media and information literacy should be integrated in the curricula and textbooks of all school subjects and courses, in the work of school and university libraries as well as the management of educational institutions. During classes, lectures or debates, teachers should encourage students to explore the unknown, support them in fulfilling their need for information and monitor their progress. Librarians should assess and select sources needed for curricula and educational programmes, manage collections and information access points and also provide training on library usage. Strategies requiring students to actively participate in formulating questions, finding answers and communicating results should be in place. In a learner-centred learning environment asking questions is the basis for everything, there is emphasis on problem-solving and critical thinking is an essential element of the process – and this kind of learning environment requires media and information literacy.

Media and information literacy is defined as a set of competencies that empowers citizens to access, retrieve, understand, evaluate and use, to create as well as share information and media content in all formats, using various tools, in a critical, ethical and effective way, in order to participate and engage in personal, professional and societal activities. For creating the sufficient media and information literacy environment several activities are needed at national level:

- The existence of mandatory courses about media and information literacy in the official curriculum, particularly in secondary school and in the teacher training curriculum;
- The existence of training programs to specialize teachers for teaching media and information literacy;
- Specific programs specialized in media and information literacy studies.

All these requirements are synthetised in the five laws of information literacy launched by UNESCO in 2018:

- "Law One: Information, communication, libraries, media, technology, the Internet as well as other forms of information providers are for use in critical civic engagement and sustainable development. They are equal in stature and none is more relevant than the other or should be ever treated as such.
- Law Two: Every citizen is a creator of information/knowledge and has a message. They must be empowered to access new information/knowledge and to express themselves. MIL is for all – women and men equally – and a nexus of human rights.
- Law Three: Information, knowledge, and messages are not always value neutral, or always independent of biases. Any conceptualization, use and application of MIL should make this truth transparent and understandable to all citizens.
- Law Four: Every citizen wants to know and understand new information, knowledge and messages as well as to communicate, even if she/he is not aware,

admits or expresses that he/she does. Her/his rights must however never be compromised.

- Law Five: Media and information literacy is not acquired at once. It is a lived and dynamic experience and process. It is complete when it includes knowledge, skills and attitudes, when it covers access, evaluation/assessment, use, production and communication of information, media and technology content." (UNESCO, 2018)

Information literacy competences of Hungarian students

In Hungary 5 higher education institutions are offering BA and MA programs in library and information science. Library and Information Science (LIS) schools in Hungary work with the same core curriculum, which is supplemented by different specializations. All of these institutions use state of the art curricula, which include a substantial number of ICT modules. Hungarian LIS students are well trained in digital literacy and can attend high quality courses on reference work.

A specialization in media and information literacy is offered in the LIS BA program at the University of Pécs. This program emphasizes the importance of a critical approach towards information and information resources, and teaches strategies of information retrieval, legal and ethical questions of the use of information. These courses' aim is to develop students' consciousness of information literacy, and to prepare them for teaching the competencies of information literacy in schools and libraries. They learn the basic terminology and components of media and information literacy, critical thinking, teaching methods, project management, as well as some school library issues. Many of these students choose a topic for their theses from the field of information literacy, so there are high quality works on these topics. Several students surveyed information literacy skills of fellow students, who study at different faculties of the university. The results of these surveys form the basis of a recent research project, which aims at revealing the current situation and is directed towards outlining a new information literacy strategy for the country (Egervári, Sipos & Varga, 2014).

A nationwide survey was made in 2014 about information competencies of university students in Hungary. We wanted to know how students get information for their studies, what are their main resources, information seeking methods, how they select and evaluate information. We got 2599 answers; our survey is not representative but significant. The respondents came for all over the country, they are students of different universities and colleges (Sipos, Varga & Egervári, 2015).

The questionnaire consisted of 64 questions. In the introductory part we asked about basic demographic issues: age, gender, living conditions, professional status, university studies, monthly income etc. We wanted to know what kind of ICT devices they have, how big is their home library, what are they doing in their free time. The main questions asked about information seeking habits of the students: where do they get the most important information from, how do they select, how much time and money do they spend on information gathering, what do they use the internet resources for etc. We also asked about their library use habits. We wanted to know how they decide if a resource is reliable or not, what type of information resources do they trust and why. One of the most interesting

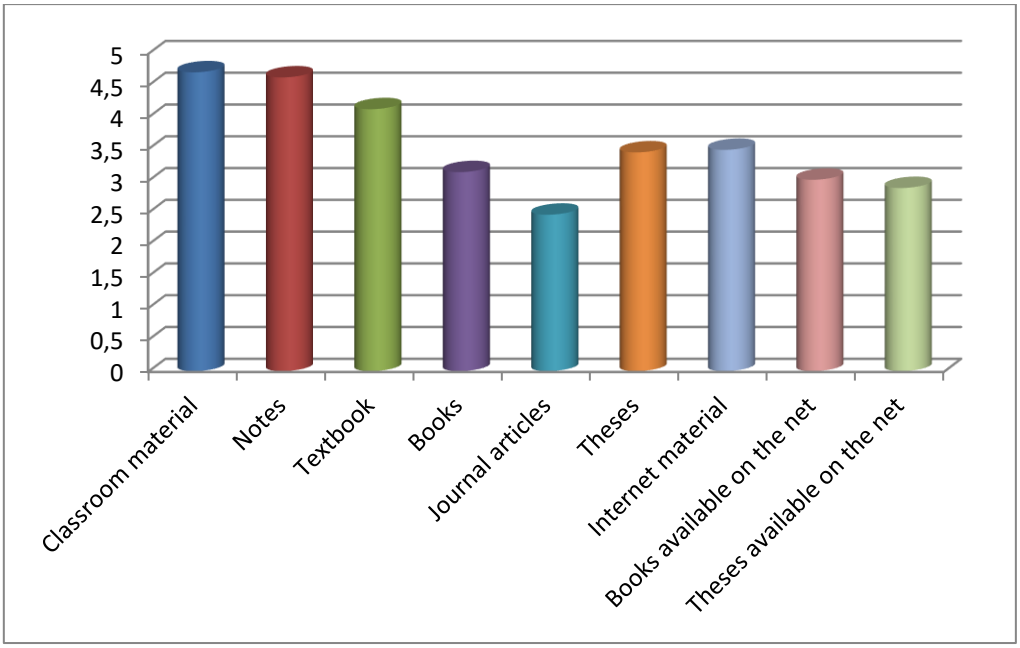
questions was about what are the main difficulties for the students during a research project.

During their studies, students have a number of assignments that require competent literature searching and analysis. They like these assignments, and they do not feel any difficulty related to them. They also acquire substantial experience in making presentations and have many opportunities to apply up to date digital technologies.

At the same time the results show that there are big problems with the knowledge and competencies of our students. Only 1/3 of them apply information literacy competencies (e.g. search strategies) in their work. They have quite weak knowledge about professional information resources (databases), their main information resource is the internet, and the main information retrieval tool is Google. The complex competencies of information literacy are not known for them, and very often they ignore planning before an information solving problem.

The most frequently used resources for learning are the classroom materials, notes and textbooks. Printed books are still quite popular learning resources, but journal articles are less frequently used.

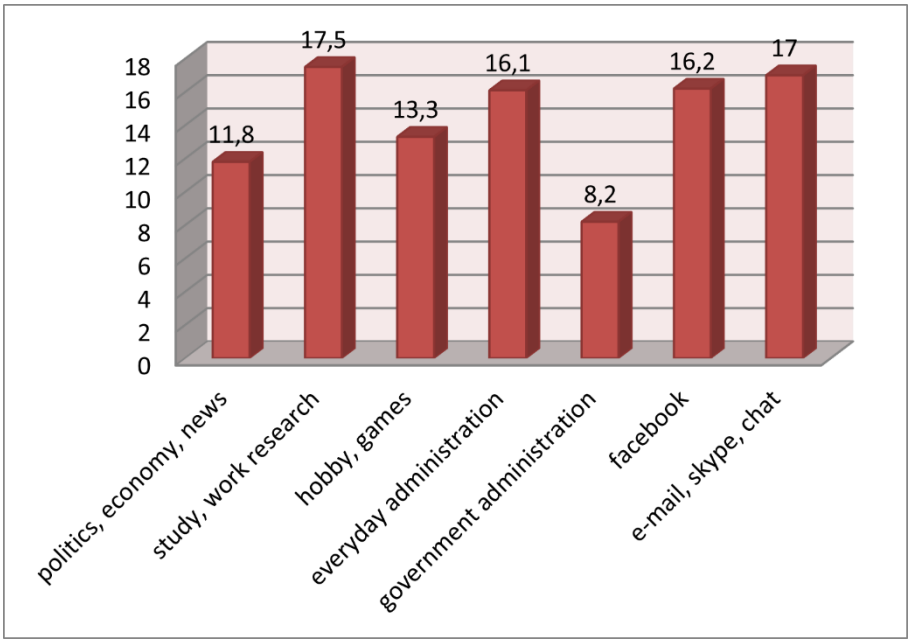
Figure 1: What resources are used for the studies? (N=2599)



Source: Egervári, Sipos & Varga, 2014, p.161

Students use the Internet mainly for social relations and learning, and less for getting political or economical informations.

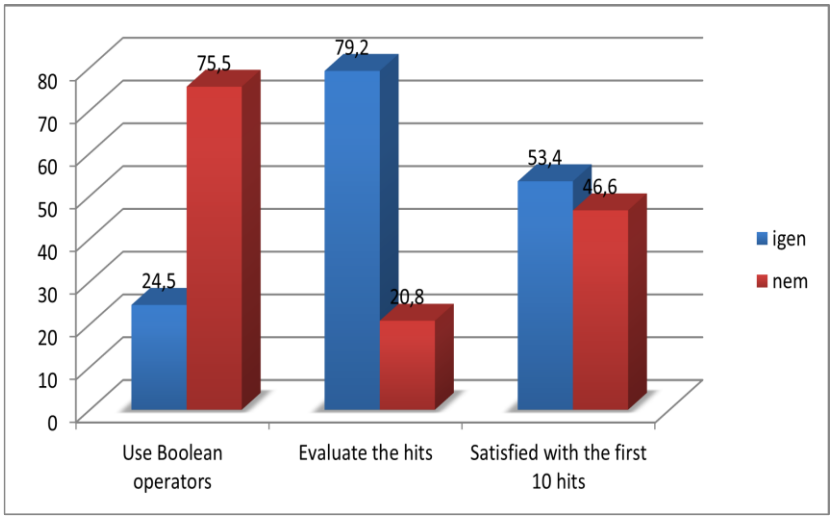
Figure 2: The aims of Internet usage (N=2599)



Source: Egervári, Sipos & Varga, 2014, p.162

Majority of the students doesn't apply search strategies, they don't use more than one search option. A lot of respondents said, they do not use operators at all. It means that they like very simple search methods. Students know that the hits need to be evaluated, but many of them still are satisfied with the first 10 hits. It shows that our students are not much concerned about the quality of their searches.

Figure 3: Search strategies (N=2599)

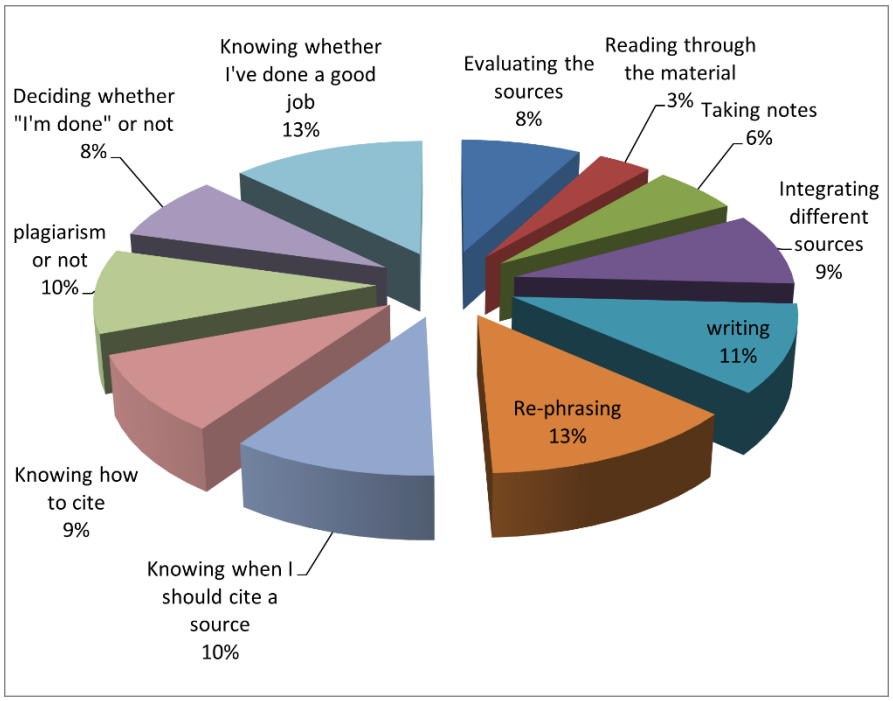


Source Egervári, Sipos & Varga, 2014, p.163

Students have no bigger difficulties in defining a search question. However, about 20% of the respondents said they have problems with identifying relevant hits. It is difficult for 40% to determine, whether a web site is credible or not. It is also hard for them to convert the collected material into new information. This means that, despite the fact that they

have opportunities for carrying out independent research, some very basic competencies that would enable them to accomplish these assignments in an efficient way, are missing.

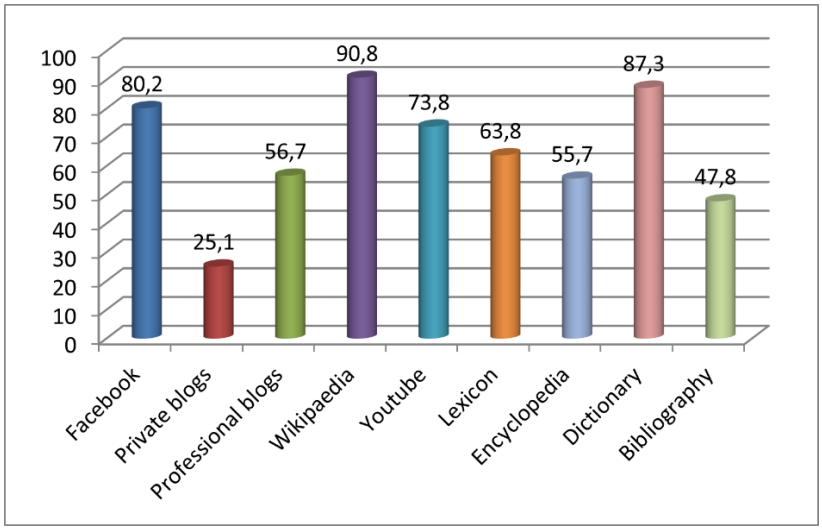
Figure 4: Difficulties in a research process (N=2599)



Source: Egervári, Sipos & Varga, 2014, p.163

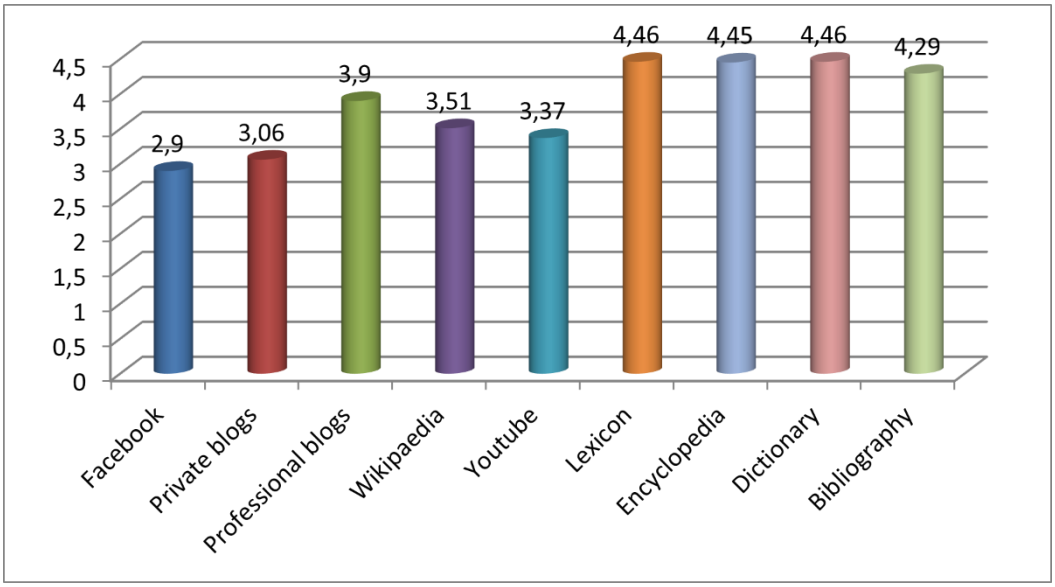
For information seeking the majority of the students uses internet search engines, mainly Google. Library catalogues, encyclopaedias and lexicons are less frequently used. At the same time our students trust traditional information resources much more than the modern, digital resources. Hungarian students rarely consult government sites, and unfortunately they do not like to use research databases in order to solve study assignments.

Figure 5: Used resources (N=2599)



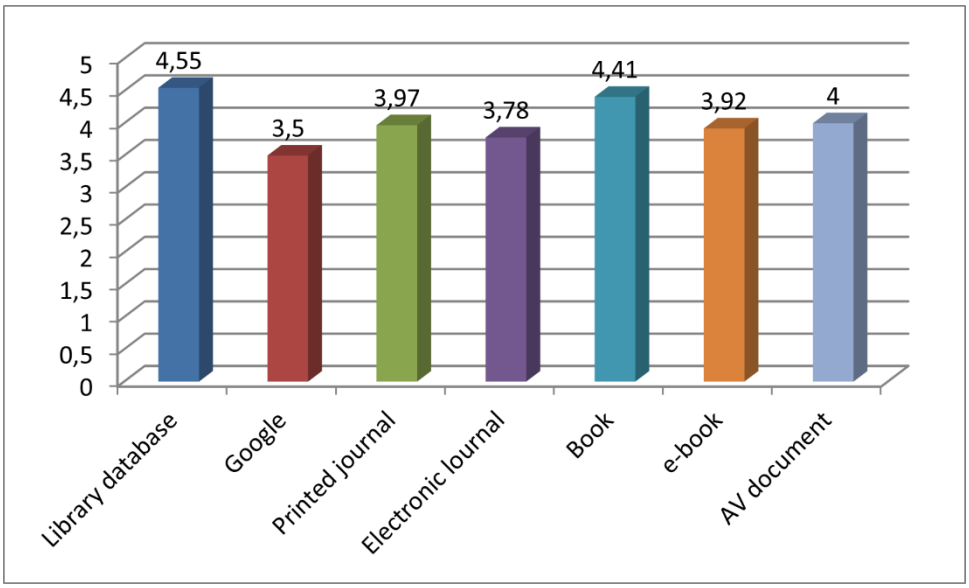
Source: Egervári, Sipos & Varga, 2014, p.164

Figure 6: Trusted resources (N=2599)



Source: Egervári, Sipos & Varga, 2014, p.164

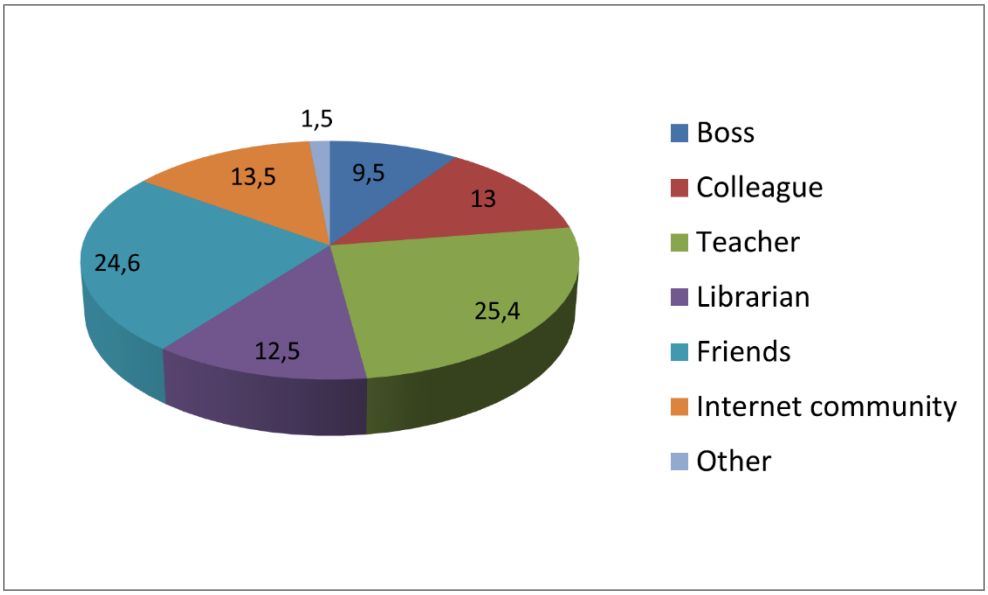
Fig. 7: Authenticity of the resources (N=2599)



Source: Egervári, Sipos & Varga, 2014, p.165

When help is needed, students like to turn to their teachers or fellows and friends. Librarians are not so frequently asked as they were expected

Figure 8: Whom do you ask help from facing an information seeking problem? (N=2599)



Source: Egervári, Sipos & Varga, 2014, p.165

In the selection process freshness and reliability are major issues, the publisher or the existence of a bibliography is not important for them. Unfortunately, Hungarian students still have difficulties in using foreign languages, so one of the most important aspects is that the resource should be in Hungarian.

The results of this survey, compared with other surveys about students' information gathering methods (McKiel & Dooley, 2013; Head, 2013), give some hints about information literacy in Hungary. Students all over the world like to choose the easiest ways to get information. Higher education institutions try to force students towards deep and reliable research methods, so they have to face several information seeking assignments. However, unfortunately Hungarian students are not well trained in gathering and selecting relevant information. In other words, their information literacy skills are limited.

Development of information literacy competencies

21st century competencies, such as media and information literacy, need to be established and continually developed. The foundation and the development of these competencies are tasks for public and higher education and cultural institutions, while other entities participating in individual learning and socializing processes also have a role to play.

The main problem is abundance, namely the phenomenon that the user is faced with organizing and interpreting an impossibly enormous amount of information. It is crucial for young people to acquire the skills for learning individually and managing information as early as possible. This means that they should learn to rank the immense amount of data and documents in order of importance, and to be able to differentiate between the essential and the irrelevant as well as between what is current and what is out-of-date information. Students should be able to select that kind of information they need to acquire out of all the important elements of information available; they need to know where

to find it in books and on the Internet, and how this information can be searched, organized and ethically used. This kind of knowledge is essential for creating an up-to-date literacy and knowledge. Not only public schools should take on establishing the foundations of information literacy, but institutions of higher education, vocational training and others within or outside the education system should be responsible for improving specific competencies.

The necessity of the institutional development of new competencies was recognized early on in the United States and in Western Europe, along with the appearance of the individual competency elements. Hungary has been struggling with the fact that it is lagging seriously behind in this field. While teachers, educators, trainers and tutors at different levels of education are often failing to attend to the foundation and development of new skills including information literacy, youngsters in many cases are acquiring these skills in an autodidactic way. For them the new competencies and their elements are not organized into a coherent pattern; on the contrary, they are clustered together extremely haphazard and unstructured, and, therefore, they lack the sequence of succession; they do not improve and do not support each other. These negative phenomena are also aggravated by people sensing they lack the skills appropriate to their needs, as they are not even aware of what skills they are supposed to have. Thus, the existence or lack of the different competency elements induces big differences in the spread of knowledge within the citizenry of the information society (Varga & Egervári, 2015). This has a significant impact on individuals' socialization, competitiveness and quality of life.

The foundation of information literacy would doubtless be a task for public education. However, neither the Act on National Public Education, nor the National Core Curriculum includes any indication of the importance and indispensability of information literacy in education. The role for higher education, adult education and vocational training would be to improve and intensify the information literacy skills already acquired in the public education system, as well as to provide specific professional training. Nevertheless, adult education providers operating outside the education system, who are in key positions in knowledge-based societies, still have an undefined place and role in the foundation and development of information literacy all over the world.

Teacher training and librarian training in higher education needs to receive much more focus, since training educators of information literacy is a crucial area for supporting the acquisition of information literacy competencies. These educators need to acquire special training in didactics and methodology during their time spent in higher education, and later during the professional development courses required of them every seven years. In order to support the widespread acquisition of information literacy, adult education should also be drawn into the framework, as digital immigrants often feel themselves outsiders in the 21st century (Sipos, 2014).

Information literacy can be acquired in two locations: within the school system and outside it. Of the two, education outside the school system finds itself in a more uncertain position, as the law mandates only public libraries to aid library users in acquiring information literacy. The law does not, however, indicate the opportunities and methods to be

used for the fulfilment of this mandate, nor does it provide programs and quality standards. It does not offer guidelines for establishing priorities, and there is no indication that it is going to do so. So far, the subsequent legislation based on the statute has not been published either. In consequence, a lack of know-how and principles may result in institutions ignoring the task.

The role of the libraries

Librarians in academic, public and school libraries have been playing a significant role in defining the content and levels of information literacy and in developing the methodology for acquiring this competency. The coordination and cooperation with various types of educational institutions and libraries is also essential. It is crucial to create a multi-segmented system of principles involving schools and libraries, in which the elements and levels of knowledge, as well as the educational tasks performed by these institutions are clearly defined.

Besides the school system, libraries stand alone in providing support for the acquisition of information literacy, which was written into Hungarian legislation in the autumn of 2012 (1997. évi CXL. törvény). At the same time, though, public libraries do not have programs for establishing and developing information literacy, and in most cases, they are lacking in the necessary human resources and expertise, which may mean that with only limited success will public libraries be able to provide the services they are mandated to offer.

Public libraries need to be in a position to provide special programs and courses for adults who are eager to learn. They are the only ones who have taken up the task of educating the public in digital and information literacy. While this task has been delegated by legislation, libraries could also in practice become fundamental institutions within the information society, defining directions for development and implementing pilot projects which would provide opportunities for everyone to acquire and develop their information literacy.

Conclusions

The shortcomings and problems of research in information literacy in Hungary may lead to serious consequences. As information literacy is not considered a key competency, educational institutions are not addressing it as belonging to the core group of basic skills, and thus they do not spend resources on establishing and developing it. That is why it is crucial to place more focus on studying the Hungarian aspects of such theoretical questions and the methodology of teaching 21st century competencies (Varga, 2013).

There is an immediate need for a system of educational principles for information literacy, for curricula supporting the acquisition of sub-skills, and for these curricula to be integrated into the public education system. We have to provide an opportunity for students to acquire, practice and improve sub-skills of information literacy in a structured system. In addition, curricula provide special content and tasks relevant to each subject area. The intermediate-level information literacy acquired in public education can then be further developed and made specific within institutions of higher education (Karvalics,

2012). That is why close cooperation between educators and librarians in higher education is essential, which can only be effective if educators provide specific tasks and projects for students that require regular use of library resources and services.

Educational institutions as well as libraries are lacking in precise definitions of the roles and tasks, which would be essential for the complex development of this competency. What is needed is the availability of and access to the latest technology and the most modern infrastructure, along with a re-evaluated role and precise task definition for institutions of public and higher education and for libraries, as these are the places where establishing and developing 21st century competencies will need to be especially prioritized.

There is a special emphasis to be placed on the role of libraries, since they are the institutions that play a major role in the acquisition and development of information literacy. At the same time, this situation poses a serious challenge for libraries that they need to prepare for. There are international programs and projects that can help libraries in this endeavour.

All this could serve as a foundation for further research, pedagogical programs, and educational concepts, which in turn could contribute to the institutionalized foundation and development of information literacy. Media and information literacy as an attitude plays an important role for members of the information society acquiring other 21st century skills and competencies, which in turn result in life-long learning and the mitigation of the secondary digital divide.

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OPTIMISATION OF IT TEACHING MATERIALS FOR STUDENTS OF HUMANITIES AND SOCIAL SCIENCES

Abstract
The demands of the 21st century mean that without digital competence and basic IT skills we cannot thrive in society. This is particularly true for students leaving higher education. Today, it is not only students in engineering and science who need to acquire ICT and IT skills. Although the latest version of the National Curriculum sets the development of digital competences as a task, the previous curriculum did not require students leaving public education to have these competences. For this reason, it is particularly important in higher education in the humanities and social sciences to develop digital competences in addition to IT skills. The paper presents the history of the introduction of IT and computing in higher education, and the process of how these subjects have been replaced in the humanities as well as in technical higher education because of the Bologna process. In addition, it presents the elements of the implementation of an IT course in an LMS system. It presents good practices and tools to increase not only students' knowledge but also their motivation, digital competences and interest in IT content.

Keywords: computer science; curriculum development; higher education

Introduction

In the 21st century, the focus in all aspects of life, be it education, the economy, or the labour market, is increasingly shifting from knowledge transfer to skills and their development. In addition, the idea that the use of computers and digital tools and content has become at least a basic requirement in our society cannot be disputed. The concept of digital literacy was introduced before the turn of the millennium in 1997 (Gilster, 1997), but its current meaning is most closely linked to Calvani's definition (Calvani et al, 2008). A key element of Calvani's definition is the idea that the development of digital literacy cannot be limited to either theoretical instruction in computing or the acquisition of an adequate level of competence in the use of computers and ICT tools. In Hungary, under the regulation imposed by the Covid19 pandemic, instructors had only a very limited time (maximum 1 week in higher education) to switch to fully online teaching (Nahalka 2021, p. 26). The success of the switch was largely determined by the previous knowledge, experience and preparation of the institution and the instructor in relation to e-learning, online course materials and the development of online course materials.

Although the ability to use ICT tools is higher among students, this does not imply an increase in digital competence and digital literacy (Tóth-Mózer & Kárpáti, 2016). In addition, there is a large difference in digital competence between students from different socio-cultural backgrounds. In their case, the digital divide can take several different forms:

the lack of physical devices (be it computers, laptops, microphones), as well as digital access, the lack of (or complete lack of) access to the internet, and digital literacy gaps. All of these factors can lead to problems that can hinder the successful delivery of an online or hybrid course.

Computer and information science is a very diverse discipline, which is why there are many possible ways to develop IT curricula on the e-learning platform and LMS. The heterogeneity of courses in higher education foresees that different types of curriculum development methods will be needed for a course that imparts purely theoretical foundations and a practice-oriented curriculum and course in a lab environment. In addition to this, it is important to note that nowadays the teaching of computer science is no longer confined to technical higher education, and therefore we also need to produce useful and effective curricula for students with interests in the humanities, for example.

In higher education, we need to consider all the above factors. We need to give students entering higher education the opportunity to integrate successfully into education, whether in traditional, online or blended environments. The concept of the "new normal" has emerged in many workplaces following the Covid pandemic, but we are also seeing a growing trend in higher education towards courses in online and blended learning environments. The "new normal" is not a set of tools, but an approach to creating a learning environment that is open, flexible and responsive to the learning objectives of the course, which best serves the interests of the students, supports students to successfully complete the course, and in doing so, gain the necessary IT and computing skills and develop their digital competence.

The aim of the study is to present the history of computer science education in higher education, with the aim of illustrating how education that started out in technical higher education has now been extended to other disciplines. The paper will then present a number of tools and methods for the development of IT and computing education in an online environment, based on examples of IT teaching materials developed in the course of the research. In addition, the paper will present practices where changes are made to facilitate the learning of IT curricula in LMS systems by humanities students, and where more complex IT topics can be easily learned by integrating them.

Teaching computer science/informatics in higher education

The concept of computer and information technology

Computer Science and Informatics is classified in the Technical Sciences Division under the heading Automation and Computer Science and Informatics, according to the nomenclature of the MTA, updated in 2016.

In Hungary, several terms have been used to describe these disciplines: computer science, computer engineering, information science, informatics. In my thesis, the concepts of computer science and informatics and their teaching are presented. These terms are often used interchangeably or synonymously in common parlance, even though they cover different disciplines. (Balogh, n.d)

"Computer science is the theoretical and applied technical science concerned with the tools of automated data processing and their use in various fields." (Hampel & Heves, 2019, p. 13.)

The term informatics was first used in 1965 at the annual symposium of the University of California (UCLA) (Papp, 2003) The English term informatics was coined as a combination of two words: information and automation; it originally described the science of automatic processing of information (Yatsko & Suslow, 2016)

According to the Oxford English Dictionary 2000 definition, informatics is: the discipline that studies the structure and properties (but not the specific content) of scientific information, and the regularities, theory, history, methodology and organisation of scientific information activity.

"Informatics is "a discipline, concerned with the recording, management, organisation and transmission of information. It does this mainly on computers. It is a science that has emerged from the integration of measurement, communications and computing, and deals with information systems as a whole" (Námesztovszki, 2018, p. 5).

"IT as an interdisciplinary field encompasses more than just information science. Likewise, informatics is more than just computer science. The interdisciplinary nature of computer science has made it possible to integrate the taxonomic theories and methods of information storage, retrieval and dissemination with new information technologies" (Papp, 2003, p. 420).

The field of information and computing has undergone a huge change. In the early days, it covered the study of the structure and general properties of information. Later, in the 1980s, it was seen as a discipline of computing tools and their applications in specific disciplines. In the late 1990s, a more holistic concept emerged, whereby it is understood as a discipline describing the laws of information processes in nature, in various technical systems and in society. Today, the term informatics is a combination of these three definitions (Yatsko & Suslow, 2016).

Information technology and the use of computing tools are now an integral part of all disciplines. In the following, I would like to outline the history of the development of computer science education in higher education, the process of how the teaching of a specific subject has become embedded in the everyday life of higher education and how the teaching of computer science and informatics has become more and more common in undergraduate courses in other disciplines.

Computer and information technology education in higher education

The teaching of computer science in Hungarian higher education started in Szeged in the late 1950s, under the leadership of László Kalmár. László Kalmár, as a mathematician, was engaged in the study of cybernetics and computer science from 1956 onwards (Klukovits & Rácz, n.d.). He established a seminar at the Bolyai Institute of the University of Szeged, where research in cybernetics, computer science, computer science and mathematical logic was conducted. Within this framework, the Kalmár logic machine was built. Based on these research results, the training of applied mathematicians was launched in 1957, where the field of computer science was represented by the subjects Programming

of Automatic Calculators and Numerical and Graphical Methods. In the years that followed, Computer Science was introduced in several places in the country, first as an optional and then as a compulsory course within other faculties (Karl Marx University of Economic Sciences, Eötvös Loránd University). In the 1970/71 academic year, the first college course, Computer Science, was launched at the Kandó Kálmán College of Electrical Engineering. In the academic year 1971/72, the programmer-mathematician course was launched at Eötvös Loránd University, the University of Szeged and the University of Debrecen, and the systems engineering course at the Technical University of Heavy Industry.

In 1972, the Ministry of Education issued a decree that computing must be taught in all science courses in higher education. In addition, in the 1980s, universities and colleges of economics, in addition to engineering and science faculties, integrated the teaching of mainly applied computing as a compulsory course in the curriculum, thus facilitating the acquisition of curricular computing skills related to the fields of study.

The Bologna process and the accession to the European Higher Education Area (EHEA) aimed not only to unify European higher education systems and make higher education more accessible, but also to adapt education and training to meet the new 21st century labour market requirements.

The Bologna process transformed the existing training courses into a three-cycle higher education system (bachelor, master and doctoral). The regulation of higher education is the Government Decree 289/2005 (XII. 22.), which included the description of the education, the courses that can be started and their credit values.

The Bologna-style transformation of traditional training was supported by the 2008 Recommendation of the European Parliament and the Council on the establishment of the European Qualifications Framework for lifelong learning. The European Qualifications Framework (EQF) defines eight levels of reference from public education to doctoral studies, with level 6 defining learning outcomes related to bachelor and level 7 almost to master level (Istenes, Kerek & Kozma, 2011). The framework attributed the learning outcomes to a triad of skills/competences, knowledge and competences.

Based on the Ministry of Innovation and Technology decree 65/2021. (XII. 29.) on the list of qualifications obtainable in higher education and on the establishment of new courses, the following higher education vocational courses can be obtained in the field of IT training: economic informatics, engineering informatics, program planning informatics (Figure 1)

Figure 1: List of IT courses

Informatika	Computer Science and Information Technology	gazdaságinformatiku s felsőoktatási szakképzés	Business Informatics	felsőfokú gazdaságinformatikus-asszisztens	Business Informatics Assistant	5
		mérnökinformatikus felsőoktatási szakképzés	Computer Science Engineering	1. felsőfokú hálózati mérnökinformatikus- asszisztens	1. Computer Science Engineer Assistant in Networks	5
				2. felsőfokú rendszergazda mérnökinformatikus- asszisztens	2. Computer Science Engineer Assistant in System Administration	
				3. felsőfokú telekommunikációs mérnökinformatikus-asszisztens	3. Computer Science Engineer Assistant in Telecommunication	
		programtervező informatikus felsőoktatási szakképzés	Computer Science	1. felsőfokú fejlesztő programtervező informatikus-asszisztens	1. Computer Scientist Assistant in Software Development	5
				2. felsőfokú multimédia programtervező informatikus-asszisztens	2. Computer Scientist Assistant in Multimedia	

Source: 65/2021. (XII. 29.) ITM rendelet a felsőoktatásban szerezhető képesítések jegyzékéről

Today, computer science education in higher education encompasses the teaching of several related disciplines. It includes the English discipline of computer science, computer engineering or computer science, and the foundations of the discipline of information technology. Whereas in the past the teaching of these disciplines was primarily under the aegis of higher education in engineering and science, today they are integrated into the teaching of other disciplines in response to the demands of the information society. According to the Directory of Bachelor's and Master's Degrees, which includes all the bachelor's degrees accredited in Hungary, the teaching of computer science and computer engineering is no longer limited to the field of computer science.

In the field of humanities, all 15 bachelor's degree programmes include computer science among their basic subjects. In addition, two courses (liberal arts and history) include a strong emphasis on IT in the area of differentiated professional knowledge, and 4 courses (history, community organisation, liberal arts, archaeology) include a strong emphasis on IT in the area of professional competences, and cultural anthropology) The teaching of information technology and computing is included in the basic knowledge for the IT librarian and sociology courses, while for the other courses it is listed among the professional competences, mainly the knowledge of information technology and computing, mainly at the application level, mainly related to the discipline. In the case of teacher training related subjects, IT appears in the basic skills for all 5 subjects and in the case of teacher training in the field of education in the modules on the field of education.

In addition, there are specialised courses within the humanities and social sciences where there is a greater emphasis on IT-related subjects within the basic skills, such as the IT librarian course. From the point of view of my research, the Hungarian IT librarianship can be considered as a special field, where "The aim of the training is to train IT librarians who will acquire librarian skills and modern IT knowledge, which will enable them to fill the positions requiring practical expertise in various types of libraries and organisations that perform information, information processing and mediation tasks" (Felvi.hu, n.d.). The teaching of IT is given more emphasis in this course than in other social sciences and humanities courses.

Education in information technology areas

"IT education is not only about giving students content they can use later, but also about developing a mindset that is timeless in the face of constant change and that they can use in different areas of their lives." (Kátai, Nyakóné & Zsakó, 2008 p. 4)

The teaching of computer science and information technology lies at the intersection of these two disciplines and the discipline of pedagogy. Several didactic principles, such as the principle of combining theory and practice, active learning, project-based approaches can be incorporated into higher education, and lesson planning along the lines of subject requirements is essential, while respecting basic didactic rules and methods.

Teaching should consider the computer and information technology skills that students need to acquire, as well as effective ways of organising curricula, principles, the design of learning environments and curriculum design principles.

Computer science can be divided into two main areas, such as computer science and computer engineering. The main organisations active in the field of computer science and information technology are:

- ACM (Association for Computing Machinery
- Institute of Electrical and Electronics Engineers (IEEE) Computer Society
- Association for Information Systems (AIS)
- Association of Information Technology Professionals (AITP)

In collaboration with these organisations, the Computing Curricula 2020 (CC2020) report has defined the following key areas within the discipline of computer science and computing: Computer Engineering; Computer Science; Cyber security; Information systems; Information technology; Software Engineering (Association for Computing Machinery,2020)

These sub-disciplines cannot be completely separated but complement and support each other and cover the computing/IT discipline.

Since 2005, the Computing Curricula series has provided tools and background information in the field of IT education, and in the field of IT and computing curricula in higher education. The 2005 report was a collection and comparison of the curricula that existed in higher education at that time. The aim of the CC 2020 project is to present methodologies that cover the needs, different aspects and concepts of current IT education and that can help curriculum design in higher education. In previous years, separate guidelines have been defined for each computing discipline (Information System Curricular Volume 2010, Computer Science Curricular Volume 2013, Information Technology Curricular Volume 2017), but Computing Curricula 2020 aimed to publish a volume of guidelines covering the whole field of computing. The concept is the same, only the content of the curriculum may differ. The report is based on the Bloom taxonomy for pedagogical taxonomies.

The report puts a strong focus on the comparison of knowledge-based and competency-based computing/informatics education and outlines future educational trends in the field of IT education in higher education. Previous Curriculum frameworks, be it IT Curriculum 2013 or CC 2005, have primarily advocated a knowledge-based approach, but

the 21st century has not yet brought a new approach. In the light of 21st century competency requirements, students' IT and digital competence gaps and the limitations of the knowledge-based approach, CC 2020 now calls for the integration of competency-based education in higher education in computer science. It proposes a shift in thinking on the format of computing curricula. It considers the first step in effective computer science education to be the assessment of the user's prior knowledge and the adaptation of the curriculum to this, while at the same time considering computer science education as an important task for the betterment of society. It illustrates with example tasks how motivating tasks could be prepared for students in each computing subject, which would not only increase digital competences but also help them to master the curriculum. The project focuses primarily on BsC and MsC computer science/informatics education programmes, but the principles, factors and methods defined can also be used for other disciplines related to the discipline.

Going beyond the specific guidelines for IT curricula, the Digital Competences Framework or the ECF framework is a good basis for the preparation of curricula. The European Competence Framework (ECF) contains 40 definitions of competences for ICT workplace performance, linked to 5 competence areas, using a common language to define the competences, knowledge, skills and proficiency levels that are considered important across Europe. The use of the e-CF by companies and organisations across Europe supports transparency, mobility and efficiency in human resource planning and development related to the ICT sector. They are also useful for educational institutions and training bodies, including higher education, professional associations, public and private sector organisations. The e-CF defines 5 proficiency levels, from e1 to e5, which are linked to the EQF learning levels 3 to 8 of the European Qualifications Framework. The Digital Competence Framework was developed by the European Commission in 2011 and is currently in version 2.1. The framework primarily uses the concept of digital competence as defined by the European Council and the European Parliament and is based on two existing frameworks, the European e-Competence Framework and the ICT Competency Framework for Teachers. The framework defines 5 domains, 21 key competences, which are essential for any European citizen in the 21st century to navigate in the digital world, and by defining several levels of competences, it provides a methodology that can be used in different areas, such as training students, teachers, skills development, transfer of competences for digital citizenship, and can also be used for measurement (Carretero, Vuorikari & Punie, 2019).

When an existing IT course needs to be converted to an online format, the first step is to choose the appropriate online platform that correlates with the course objectives. In addition to this, it is important to ensure online communication with students, to measure knowledge and to explore the possibilities for student assessment. Above all, however, the need to digitise existing course materials, textbooks and teaching aids for the course in question. The course material and the structure of the lessons need to be reviewed with a view to what changes are necessary to ensure that the course remains effective when integrated into an LMS system. In this paper I attempt to answer the last question.

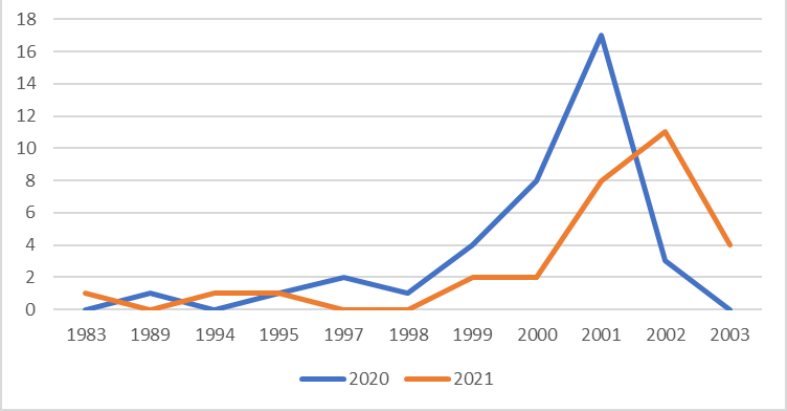
Further development of IT teaching materials

Presentation of the research

The research was conducted at the Institute for Human Development and Cultural Studies of the University of Pécs. During my research, I studied a course that is compulsory for first-year students in the first semester, the Informatics course. The students took the Computer Science course in a blended environment, where the practical course material was delivered face-to-face/in person in an online contact hour in the Teams interface, and the Moodle LMS (Learning Management System) learning framework was used for the theoretical learning. The course aims to introduce students to basic computing principles, software and hardware, and to develop their digital competences.

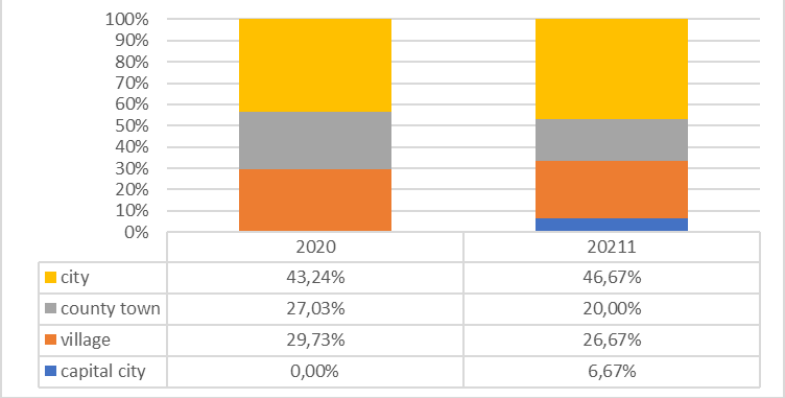
The research was conducted in two phases, in the autumn semesters of 2020 and 2021. The course was attended by students from 3 departments: a BA in Computer Librarianship, a BA in Community Organisation and a full-time BA in Teaching. 42 students took the course in the autumn semester 2020/2021, with approximately 35-37 students actively using the Moodle platform. To verify the results of the research, the research was also implemented in the autumn semester 2021, when some curricular elements were developed to optimise the course content. In the autumn semester 2021/2022, 32 students took the course, of which 26-27 students completed the tests related to the course materials. Of the students who took the course, 63.9% were female and 36.1% male in 2020 and 80% were female and 20% male in 2021. Looking at the age distribution of the students, most participants were born after the mid-1990s, so we can speak of Generation Z. (Figure 2) Geographically, about 70% of the students in both years came from a major city (Figure 3).

Figure 2: Distribution of students' year of birth (N= 67)



Source: own editing

Figure 3: Distribution of students' year of birth (N= 67)



	2020	20211
city	43,24%	46,67%
county town	27,03%	20,00%
village	29,73%	26,67%
capital city	0,00%	6,67%

Source: own editing

A good measure of students' future progress can be the analysis of the existence of exams related to previous IT knowledge. In 2020, 31.25% of students graduated at intermediate level and 3% at advanced level in IT. In 2021, there were no students graduating at advanced level, and 35.29% of students at intermediate level passed the maturity exam. In addition, 11% of students in 2020 and 8% in 2021 were ECDL certified. This shows that about 2/3 of the students on the course do not have a previous knowledge exam. Although having a final exam certificate and knowledge of the ECDL modules provides a good basis for IT knowledge, it does not cover all areas of digital competence, so for these students it is necessary to deepen their previous knowledge and orient them further.

The students on the Computer Science course learned the theoretical material through self-paced learning in the Moodle LMS. The framework consisted of 6 learning units, each consisting of 4 lessons. The 4 lessons were delivered in 4 different curricular structures, some parts of the curricula were available in a specific Moodle lesson, others were supported by video and images. In addition, the curriculum included embedded digital literacy elements, mainly in the areas of information and data management, digital content production and communication digital literacy. Completion of the subject consisted of the acquisition of theoretical and practical knowledge, but this study focuses only on the online learning materials and their development. The study of the effectiveness of the course materials uploaded on Moodle was based on the results of test assignments, the analysis of student scores and the analysis of a questionnaire completed by the students.

The first step in designing and developing the course was to define the IT type of the course. This is necessary because the methods used need to be distinctly different across the types of courses and disciplines within the field of informatics. Determining which category the course we are teaching falls into will help us to use methods and software to effectively transfer knowledge to students. The following three types of courses can be clearly distinguished: a theoretical-focused course, an applied IT-focused course with software requirements and applied IT-focused course with hardware requirements. It can be said that a complex curriculum management and learning support platform is needed where both teaching and learning can take place. Ideally, software should be able to use e-learning materials, video-conferencing, digital collaboration tools, student accountability, competence development and activity enhancement, and gamification. For all courses,

it is important to provide students with the required literature or course material online. Ideally, this should be an optimised, interactive courseware in a dedicated LMS system with different learning paths for the students. In addition, each course has elements that are specific and require discipline-specific support environments and software. This includes whether virtualisation is required, whether the specific need can be addressed using a browser, and whether a free software solution is available for the specific subject.

The special feature of this Computer Science course is that it does not focus on any one sub-field within computer science (such as networks, database management, operating systems), but gives a broader view of the discipline of computer science, starting with a historical overview, practical aspects and including a presentation of future trends.

As the theoretical part of the course is very complex, covering a wide range of IT topics, the different elements of the course have been structured in different ways. As already mentioned, the theoretical knowledge of the course was delivered in the Moodle framework, using several different types of course materials. In addition to text, image and video content, this platform allows the integration of different quizzes, questionnaires and interactive learning elements to facilitate the understanding of the course material. In addition, these tools can also help students to develop their competences.

The aim of the course is to provide students with an understanding of IT and computer science that will enable them to become more comfortable with different IT problems and systems, more confident in using them and more motivated to consume this content, which, as mentioned above, will be essential in many areas of their daily lives.

Online learning support systems provide a range of tools to increase student motivation and improve the effectiveness of learning materials in online courses. When adapting course content, it is necessary to consider the characteristics, prior competences and skills of the target audience, in addition to the examination of the course content. To determine these characteristics, at the beginning of the course, students completed a questionnaire in which they indicated their digital competences, their confidence, their practice in different areas of digital competence, and various demographic information. Data on students' competency levels have been presented in a previous study (Kovács, 2021).

The computer science course studied was taken by first-year university students with a graduation, 90% of whom were Generation Z students. Students are characterised by a high ICT tool usage and confidence in using ICT tools, but a lack of interest or a complete lack of interest in IT at a deeper level. (It should be noted here that digital competence as an umbrella concept is not just one competence, but a set of interrelated competences. The students tested had a high level of competence in some competences at the beginning of the semester, but in other competences there were gaps.)

In the following, three different types of learning materials are presented, which have been used to develop the already existing online learning content with a theoretical focus. The course materials were developed based on student feedback received during the first semester, student outcomes, and suggestions from the literature. The development of the course materials focused on the adaptation of course elements that were largely text-oriented during the first semester and those that integrated several different types of media

and that, based on student feedback, contained too many different types of information and were difficult for students to process.

The study presents, in a non-exhaustive way, an improved curricular content for each type of content and the related results. To evaluate the results, the results of the tests related to the curriculum and the end-of-semester evaluation questionnaire completed by the students were used. Students were asked to rate the units of the course material, both individually and, on a Linert scale of 1 to 5, based on usefulness, interest, well-structured content, and followability. In addition to this, we also looked specifically at which elements of the curriculum were particularly popular with students and what they were not satisfied with. The following types of content were used/created in the enhanced learning materials: interactive content, short animated videos; infographics; and H5P interactive curriculum content.

Interactive content, short animated videos

In the case of Generation Z students, longer videos (often over 10 minutes) often fail to achieve the desired results. Generation Z young people have good attention-splitting skills but find it difficult to use them in the learning process. Their average attention span has decreased from 12 seconds to 8 seconds compared to previous generations (Mládková, 2017).

However, short videos lasting a few minutes (2-3 minutes) can be very useful to arouse students' interest in a given topic, which in some animated version can increase their interest in the learning material and increase motivation by appealing to more of their senses. Such videos have been used in a few cases in the case of learning materials produced on Moodle. A Moodle lesson type learning material has been created for each unit, where each unit is complemented by a series of quizzes. The first part of each of these lessons contained a short video, which drew the students' attention to interesting facts and information about the given subject.

Figure 4: Fundamentals of Networking, the first introductory video of the Moodle lesson type curriculum of the Internet unit on Moodle

Source: own editing

Figure 4 shows the first introductory video of the Moodle lesson type of the Internet Basics courseware unit in the Moodle interface. The integrated video presents an activity

that plays a key role in the students' daily lives, integrating information that is fundamental to the curriculum unit (networks, internet), yet little encountered by the students before. The video is 4 minutes long and aims to arouse the students' interest in the deep layers of the topic.

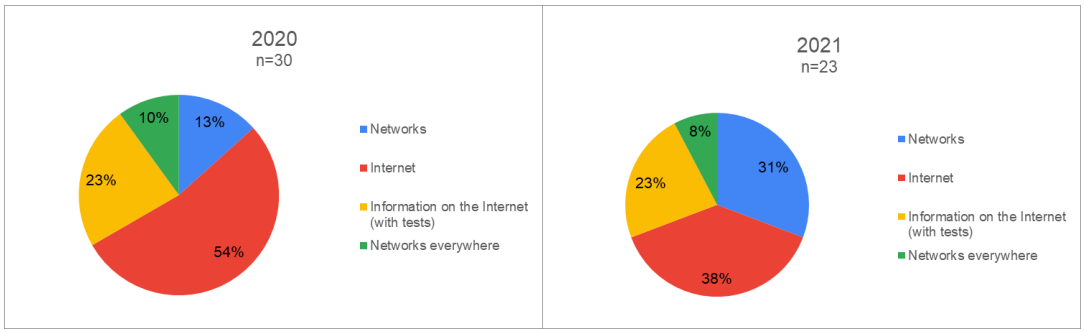
In addition to this, the students were shown a 4-minute TED-Ed video on how the World Wide Web works in the second lesson of the curriculum.

“TED-Ed — TED's youth and education initiative — aims to spark and celebrate the ideas and knowledge-sharing of teachers and students around the world The TED-Ed project — TED's education initiative — makes short video lessons worth sharing, aimed at educators and students. Within TED-Ed’s growing library of lessons, you will find carefully curated educational videos, many of which are collaborations between educators and animators nominated through the TED-Ed platform.” (TED, n.d.)

The TED-Ed videos include animated videos on a range of topics related to our own field, or we can create our own. The creation of these types of videos requires a large investment of time and a high level of competence in video and animation software, so in many cases it is useful to use existing videos available as OER (Open Access Resources). In such cases, however, we need to monitor the life cycle of the videos to see if they are still available to students at the external source site or url. In the case of videos in foreign languages, it should be ensured that subtitles are available for the video so that the foreign language text does not hinder the understanding of the text.

In response to the question "Which of the following units did you like the most?", the students who took the course chose the two video units (“Information on the Internet” and “Internet”) shown in Figure 8, in both 2020 and 2021, by the highest percentage:

Figure 5: The effect of course units containing short animated videos on students



Source: own editing

In the year 2021, the effectiveness of these teaching materials decreased slightly, but as we can read below, these teaching materials already contained improved teaching materials, such as infographics and H5P teaching materials.

Using infographics

In most cases, information is delivered through a combination of different media elements on an online platform. In addition to textual information, a variety of illustrated content is used to effectively convey knowledge. These can be photos, graphs or infographics related to the topic. Infographics "belong to the broader field of visualisation, i.e. they make things that are not self-evidently visible visually perceptible" (Barátiné Sipos, 2021). Its aim is not (only) to please the eye, but to see deeper into a set of data. It is a tool for analysis, communication and understanding (Cairo, 2012).

Several attempts have been made to define the term infographics, but for the purposes of our research, the following definition most fully captures the concept of this media element: "the transformation of an already created information file, typically consisting of data, numerical series, statistical raw material or formalizable units of knowledge, into a form that makes understanding easier and faster and the recognition of key relationships possible." (Csatlós, et.al, 2011)

Based on Pavio's 1970 theory of Dual Coding, when processing information, memory uses two separate but related codes, one verbal and one visual. According to this, when both verbal and non-verbal elements are used to transfer knowledge, more brain activity takes place, making it easier to retain newly acquired knowledge (Csatlós, et.al. 2011).

In all cases, an infographic is made up of three main elements: data and information, the message to be conveyed, and some graphic element to support the knowledge and help the listener to absorb the information.

Heber define infographics as a visual medium that is informative, has a meaning-filtering quality, is produced in a comprehensible form, is memorable, aids comprehension, strikes a balance between a lot of information and a little information, and is produced in an ethical way (Heber, 2018).

Ritchie, in his typification of infographics in 2020, distinguishes three types of infographics, such as data visualization, information model and editorial infographics. In terms of content type, Adams (2011) distinguishes causal, chronological, quantitative, directional, product-specific infographics.

Adams categorises infographics along this static-dynamic axis (static, dynamic, interactive), where the degree of user involvement varies, but classically, an infographic is considered as a content element produced in a static form.

In LMS systems, to increase the efficiency of the information related to our course, we can use infographics, be it data visualization or information model type graphics, where we put different concepts, processes, hierarchies, chronological type data in a graphical form.

In his 2013 study, Cs. Péntek writes about the role of infographics in scientific communication and defines the following types in terms of content and way of data presentation: data visualisation, process or explanatory diagram, map or poster type or complex infographics.

The production of infographics requires additional competences on the part of the creator, such as visual vision, the ability to use graphics software, the ability to condense information into an effective form.

There are several free online software (Canva, pictochart, Venngage, Visme, Infogram, etc.) which include built-in templates that can be used to create most types of infographics

Within our own educational/research field, the first step is to determine the purpose of the infographic, what type of information we want to display, whether it is for data visualisation, to illustrate certain processes or phenomena, or to supplement the text-based learning material. Within the framework of the computer science course, Adams' typology has been used to create and integrate infographics of a causal and chronological type. These were presented (see Péntek) in the form of flow or explanatory diagrams, posters and composite infographics. The figure below shows an infographic illustrating the computing tools used in the history of computing for the 'Before the spread of computers' section of the curriculum, which presents and illustrates each tool in chronological order. The infographic is presented in addition to the textual content, with a more detailed description of each tool and a verbal explanation of one of the calculation methods. There were two test questions related to the completion of the unit, which caused difficulties for students in the 2020 school year, hence the infographic.

Table 1: History of Computer Science test questions

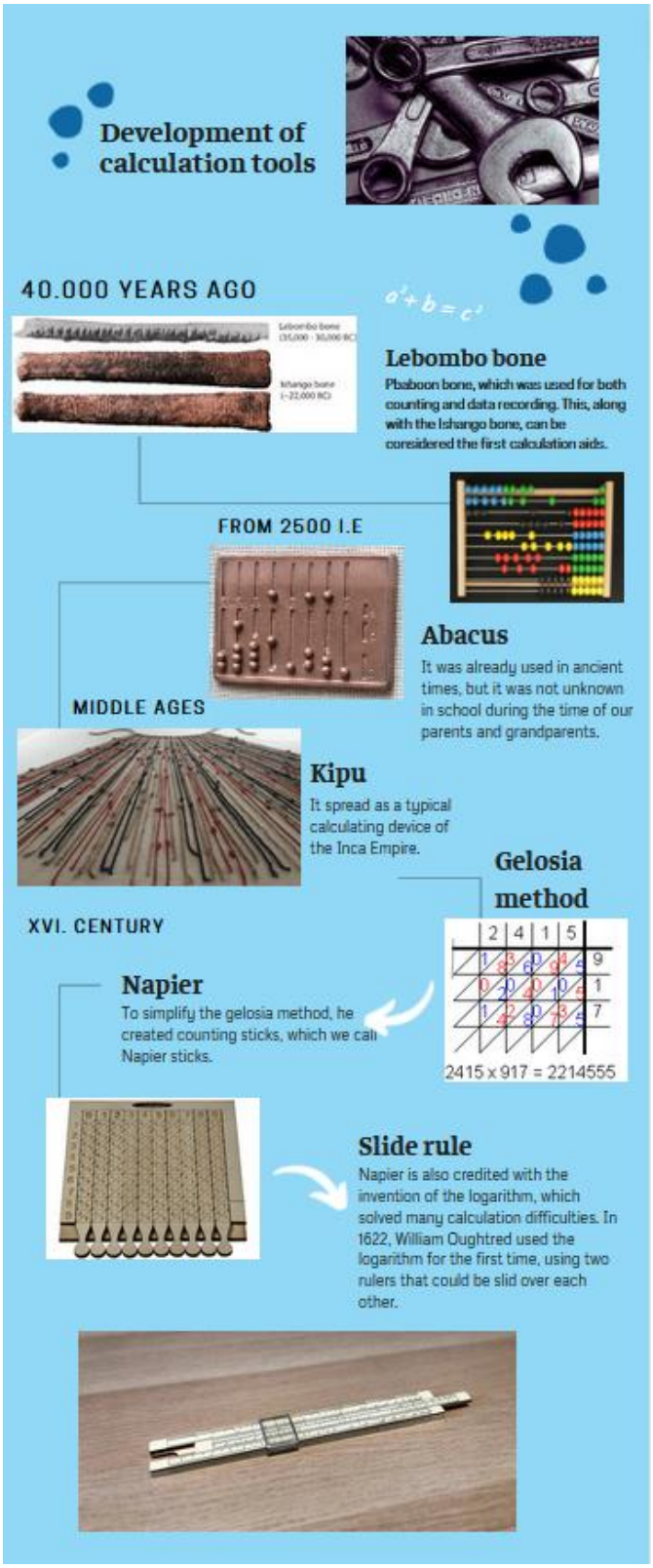
Question 3: Put the following tools and methods in ascending order of when they were first used. * logarithm * Lebombo bone * Napier sticks * abacus * Gelosia method
Question 4: Which of the following people is credited with inventing the logarithm?

Source: own editing

The above questions cover the time dimension of the unit in a complex way, and the success rate of the answers to question 4 was the lowest in the previous semester. For question 4, 40% of students answered correctly in 2020, while for the other questions almost 95% of students answered correctly, the standard deviation of the scores for this question was 0.3 but based on the 2021 results the standard deviation has decreased to 0.2.

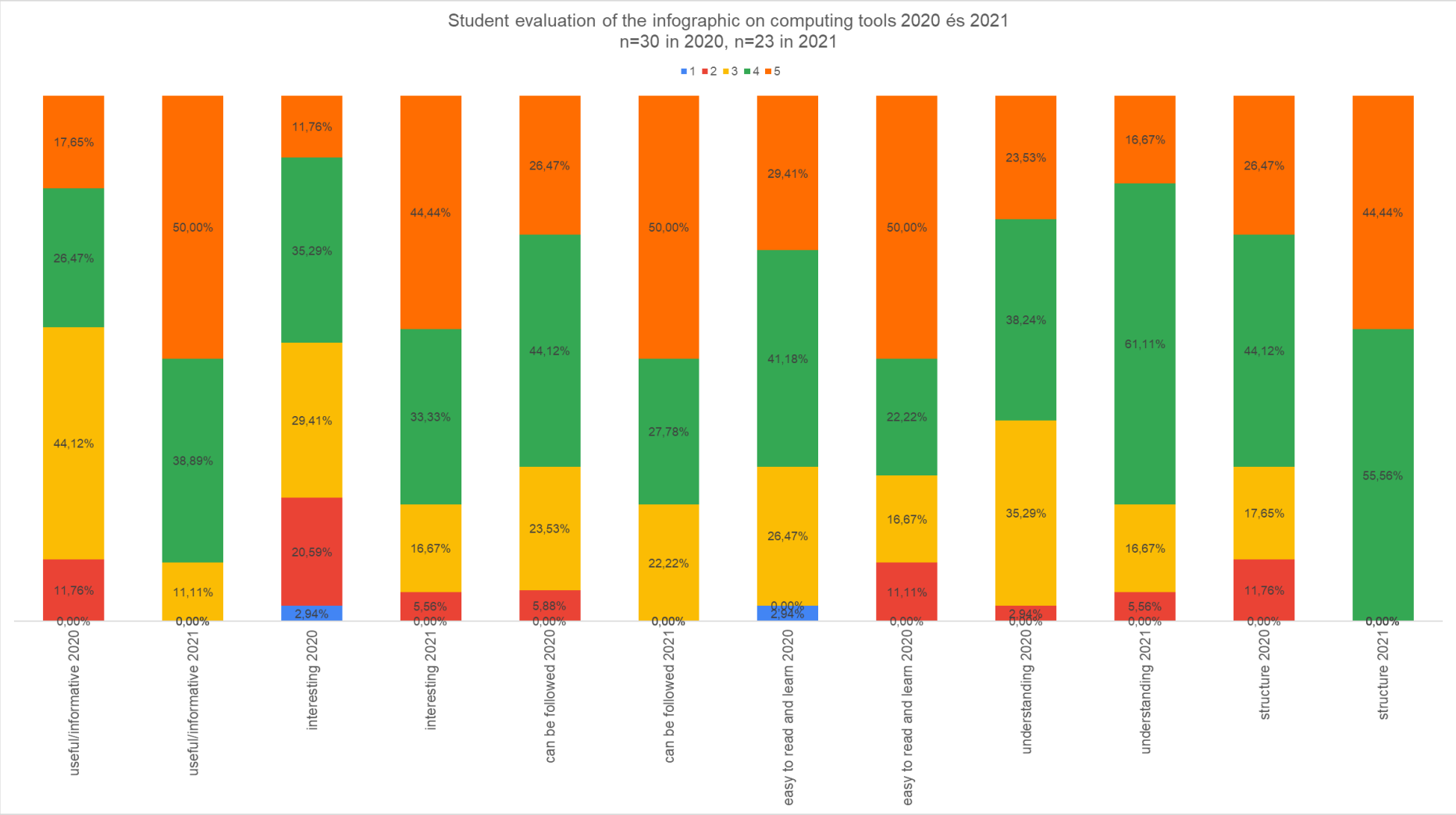
The students were also given a more complex task related to the topic, where they had to search for credible and relevant information on a topic related to the course content. For this question, the percentage of students achieving the maximum score also increased slightly from 60 to 62% and the standard deviation of the scores decreased from 0.46 to 0.38.

Figure 6: Computing tools infographics



Source: own editing

Figure 7: Student evaluation of an infographic on computing tools



Source: own editing

Based on the students' evaluations, the complete curriculum has also improved compared to the first semester of the 2020 academic year, with more than two thirds of the respondents giving a 4 or 5 in all aspects (useful/informative, interesting, well-structured, easy to follow, understandable).

H5P

The H5P content is based on the latest version of HTML (Hypertext Markup Language), HTML5, and can be used to create responsive, mobile-optimised content, with the added benefit that students will get the same content experience whatever type of ICT device (smartphone, tablet, laptop, personal computer) they use to access the content. The H5P plugin can be integrated into any Moodle system and allows curriculum creators to create content such as interactive videos, interactive books, presentations, interactive quizzes.

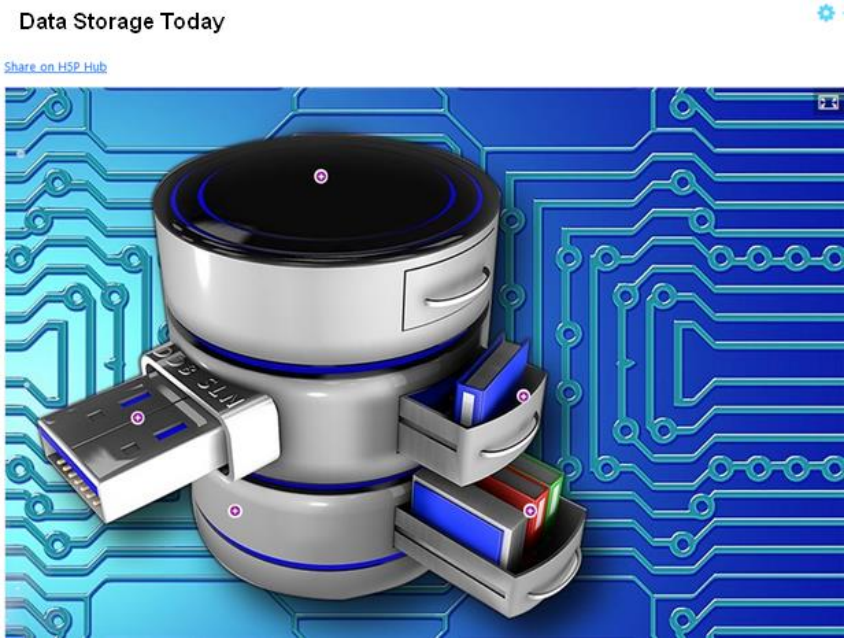
"H5P makes it easy to create, share and reuse HTML5 content and applications. H5P empowers everyone to create rich and interactive web experiences more efficiently - all you need is a web browser and a web site with an H5P plugin." (H5P, n.d.)

Several H5P contents have been created within the IT course, one of them being an "image hotspot" type content.

The subject of the course was Data Storage Today, which aims to provide a practical overview of modern data storage options and to introduce the basic concepts and principles of data storage.

In the enhanced curriculum, the content information was placed in an H5P element, an image hotspot. This HTML5-based content type helps to reveal detailed information in the form of text, videos, images in a pop-up window when a user clicks on a hotspot. With image hotspots, we can create more interactive online lessons and increase learner engagement and motivation.

Figure 8: Data storage today H5P curriculum element



Source: own editing

In this case, the image contained 5 hotspot areas. Each hotspot covered a larger topic area, where information on the topic was created by integrating text, images and short video content. Each hotspot dealt with the future evolution of data storage, partitioning, protection of data storage, data storage problems. Each of these topics is an area that students will encounter in their daily lives.

The topic assumes a higher level of computing competence than the previous two chapters of the subject, so a more interactive content will help the student to master complex areas of IT related to data storage. As in this case the content was more complex and not focused on the acquisition of a specific fact, both semesters were assessed with open-ended questions.

Data analysis was based on responses where all questions were answered, and the full test was completed. Students were awarded a maximum of 2 points per question and scored in half-point units. It can be said that the average scores did not change significantly over the two semesters studied, but in both cases the students scored very well. The average scores for the tests were 90%.

The first question was the most technology-oriented question: "Summarize in a few sentences what and how RAID technology can be used." This is the topic that students encounter the least in their daily lives. The other two questions appear more frequently in everyday life. What do/can you do to protect the health of your hard disk? What is partitioning, what is it used for? Based on the 2021 data, the percentage of students achieving the maximum score has not increased, however, for the first question, only 1 student did not achieve the maximum score, compared to 85% of students who were able to achieve the maximum score in the previous semester.

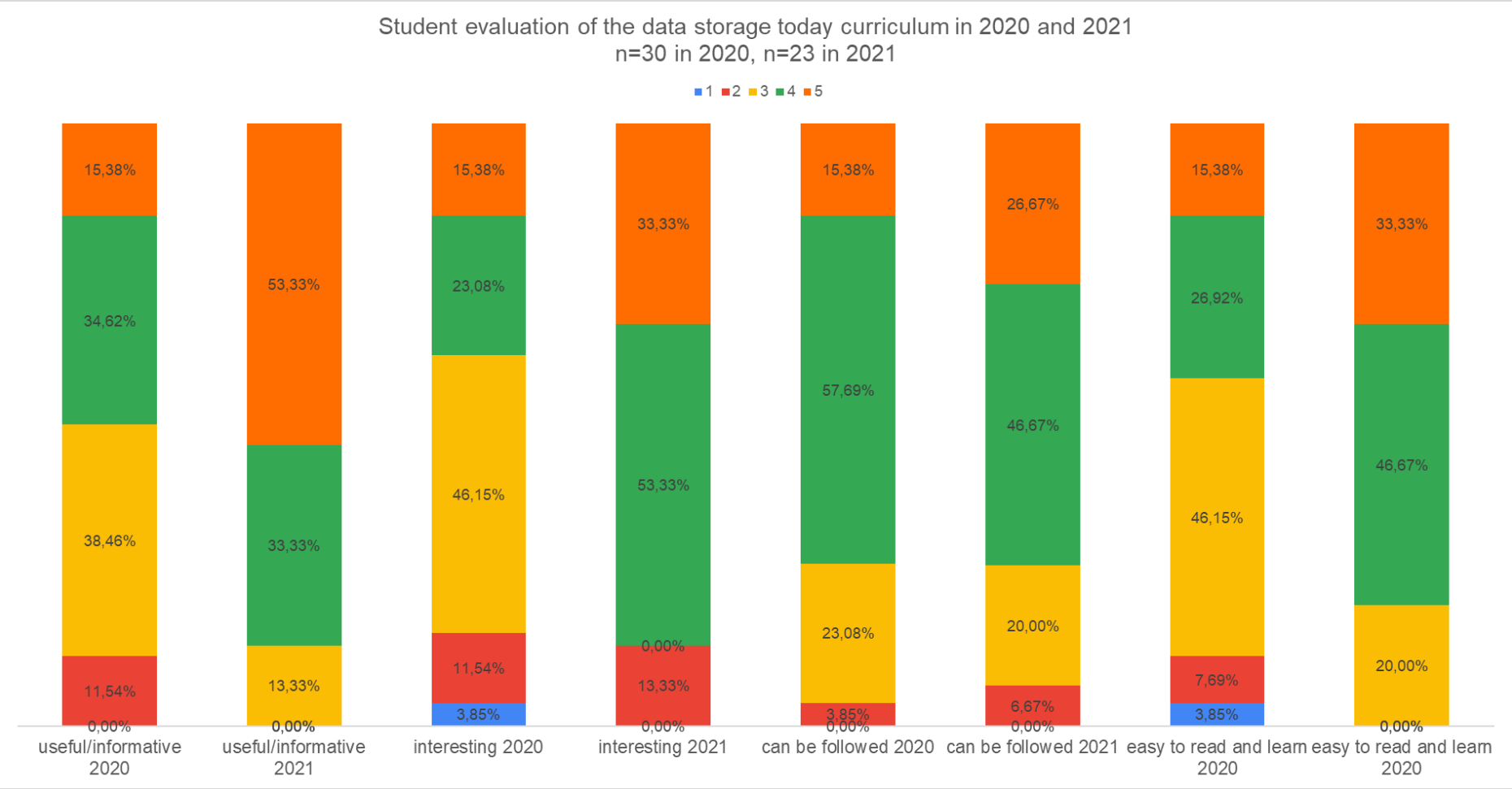
Based on the above results, we do not see significant progress in the acquisition of the curriculum, but there is an improvement in the interest and engagement of students. Based on data from the end-of-semester questionnaire.

Relevant answers to the question "Was there anything you particularly liked about the COMPLETE curriculum? Which part and what! (relevant, interesting, surprising, etc.)"

- "I liked "Data Storage Today" the most as it was very creatively solved and made it much easier for me to learn."
- "Data Storage Today course material contained a lot of interesting information."
- "I didn't know before how exactly data storage works and now I understand it better."

Students rated each curriculum element based on interest, structure, informative content, and followability. On all four criteria, the chart shows an improvement, with orange (5) and green (4) responses accounting for more than 80% of the total responses in terms of usefulness, interest, structure. The smallest change is seen in terms of comprehension, the ability to follow the curriculum, but here too the maximum score is higher, with 26% of respondents scoring the maximum score on this aspect of the curriculum, compared to 15% in 2020 (Figure 9).

Figure 9: Student evaluation of the data storage in everyday life curriculum in 2020 and 2021



Source: own editing

Summary

The field of computer science presents a very diverse picture. The body of knowledge behind it can be presented in a wide variety of formats, depending on whether you are producing a course for a professional, a layperson or even a student or teacher in another discipline. However, the various LMS systems nowadays provide us with a wealth of possibilities to make a computer science course material enjoyable even for those who are not technically inclined. The results of the research show that the acquisition of the learning material takes place in the case of "traditional" knowledge material with illustrations and text, as well as in the case of enhanced learning material. The difference can be seen in the increase of students' interest and motivation, as an interactive H5P learning material with interactive elements, interactive books, infographics or videos was more positively evaluated by first year humanities students.

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