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Assessment of secondary school students' transversal skills in Latvian language at optimal and highest levels

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Abstract. Transversal skills are a set of knowledge, skills, and attitudes that are needed today by all sectors and professions to respond effectively to different life situations, critically assess and solve problems, work with others, and make meaningful use of technology. In school, it is essential to develop transversal skills as they help students not only to learn the subject content but also to develop the skills needed for further life and careers. Accordingly, a study was carried out on transversal skills in Latvian language at the optimal and highest levels in secondary school. Research question: How do secondary school students who learn Latvian language at the optimal and highest levels self-assess their transversal skills? The results indicate that civic participation, digital, and collaboration skills are better developed than self-directed learning skills at the optimal and highest levels. Students who learn Latvian language at the highest level assessed all their transversal skills slightly higher on average compared to students who learn Latvian language at the optimal level, and the difference for all transversal skills except collaboration skills is statistically significant.

Keywords: transversal skills, secondary school, Latvian language, optimal level, highest level

Introduction

Interdisciplinarity and the competent transfer of academically acquired knowledge and skills into the world of work are among the characteristics of 21st-century education. One of the opportunities to implement this innovation is through transversal skills (Karapetjana et al., 2017). The necessity to focus on transversal skills is driven by unprecedented and complex changes: rapid and radical technological advances, transformative forces and challenges of globalization, environmental sustainability, demographic change and migration, and political uncertainty (Whittemore, 2018).

Transversal skills are defined as skills that are not specific to a particular learning subject but contribute to gaining knowledge in different contexts and with different ways of thinking and self-driven learning. Therefore, transversal

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skills allow individuals to strengthen the link between new knowledge and skills and personal experience. The development of these skills plays an important role in promoting sustainable economic growth, social inclusion, and competitiveness (European Commission, 2024), which is considered one of the challenges at all levels of education (Jussila et al., 2023).

In secondary school, transversal skills are essential to ensure the continuity of students' achievements in academic activity and future life-long activities. In a rapidly changing world, it is difficult to predict what learning areas of knowledge and skills will be needed (OECD, 2018). Transversal skills are a fundamental tool that enables students to analyze, critically evaluate, and make decisions to identify and determine future perspectives.

As a result of changes in content of learning and organization in Latvia, the Cabinet of Ministers has defined transversal skills that have to be acquired in secondary school — critical thinking and problem-solving skills, creativity and entrepreneurship skills, self-directed learning skills, collaboration skills, civic participation skills, and digital skills (Ministru kabinets, 2019). Transversal skill assessment is a challenge not only in higher education but also in secondary education (Āboltiņa et al., 2024; Carrió, 2022).

Objective of the study: To evaluate and compare secondary school students' transversal skills in Latvian language for students who learn the language at the optimal and highest levels.

Research question: How do secondary school students who learn Latvian language at the optimal and highest levels self-assess their transversal skills?

Theoretical background

As a reaction to rising global competitiveness and demographic challenges, the National Development Plan of Latvia for 2021–2027 emphasizes the importance of modern education and accessibility to it throughout life as well as the necessity to develop various competences. (Pārresoru koordinācijas centrs, 2020). In the context of Latvia, learners are generally good at tasks that require remembering or acting in familiar situations but lack the skills and experience to examine and process diverse data, work in a team, offer solutions to non-standard situations, build relationships between theoretical learning and actual life experiences, analyze accomplishments, and set goals for future works. Students also lack the skills to realize their ambitions in new settings (Skola 2030, 2019a). The need to improve the content and approach of learning stems from the above in order to reduce fragmentation, passive learning, theoretical knowledge learning without real-life situation context, and isolated skill development.

In order to improve the school system and address pressing issues, ambitious education reforms were launched in Latvia in 2018, focusing on improving both learning content and the organization of the learning process, including its complexity, systemicity and succession, and measurement of results (Skola 2030, 2019a). The purpose of competency-based education is to provide contemporary education with the necessary knowledge, skills, and attitudes to enable a true understanding of the learner and the capability to transfer knowledge to new situations and contexts.

As a result of this reform, students in secondary education have the opportunity to learn Latvian language and literature (usually in grades 10–11) at the optimal level and then move on to Latvian language and literature II as one subject at the highest level (usually grade 12). Two examinations have also been developed — the Latvian language examination at the optimal level and the Latvian language and literature examination at the highest level. All students have to take the Latvian language examination at least at the optimal level as one of three mandatory examinations (Latvian language, mathematics, and English language) in order to graduate from secondary school. After learning Latvian language and literature II, students may also take the highest level examination (Urbanoviča, 2021).

Every secondary school student in Latvia, regardless of the selected educational program and subject level, must acquire transversal skills in order to be able and want to learn independently for a lifetime, plan and manage his or her cognitive process, develop positive relations, and make responsible decisions.

Transversal skills are related to a wide range of occupations and sectors (Flora, 2014; Pârvu et al., 2014; UNESCO-IBE, 2013). Various other terms are closely related to transversal skills and are sometimes used as synonyms, like 21st-century skills, transferable skills, or key competences. The need for transversal skills is dynamic because it will change over time depending on the new context students will enter, so they need to be prepared to continue learning throughout life (Glasbeek, 2018).

The general nature of transversal skills allows them to be used in different contexts (Direito et al., 2014) — not only in the context of education but also, and much more importantly, in different professional situations and tasks (Sá & Serpa, 2018). This transferability of skills determines the importance of promoting these skills in the learning process, emphasizing the need to develop transversal skills at an appropriate level even before entering the labor market (Larraz et al., 2017).

Transversal skills have become more important as the world changes and have an impact on the lives of secondary pupils as well. Gratton (2014) names five forces that will affect students' future lives: the power of technology (rapid technological advances that change all aspects of life), the power of globalization (such as urbanization, the ever-growing global labor market, and ever-growing competition and fragmentation), the power of demography and longevity (increasing global migration and people living longer, healthier, and more productive lives), the power of society (changing society and the way people perceive their lives and communities), and the power of energy resources (rising energy costs, rapidly changing climate, and sustainability culture).

The European Union has identified eight competences needed for life pertaining to a sustainable lifestyle, employment, active citizenship, and social inclusion (European Commission, 2019a): literacy competence; multilingual competence; mathematical competence and competence in science, technology, and engineering; digital competence; personal, social and learning to learn competence; civic competence; entrepreneurship competence; cultural awareness and expression competence. (European Commission, 2019b).

Cabinet Regulation No. 416 of the Republic of Latvia was taken into account when creating the questionnaire for research (Ministru kabinets, 2019).

Accordingly, transversal skills and their content definition, as well as the planned results to be achieved by the secondary education students at the general, optimal, or highest level, were taken into account (Skola 2030, 2019b). Table 1 presents the content framework of the transversal skills and the corresponding questionnaire statements.

Table 1. Transversal skill framework

Transversal skill	**Questionnaire statements**
Critical thinking and problem-solving skills — describes and critically analyzes complex situations and abstract ideas, obtains comprehensive and accurate information about them, employs situational problem-solving strategies, proposes different solutions and chooses the most fit for purpose, and adapts flexibly to unforeseen changes.	1. I purposefully understand the context of the text to understand and analyze information. 2. By reasoned proof, I correct errors in speech and written language. 3. I choose and implement the most appropriate problem and task solution.
Creativity and entrepreneurship skills — the student, looking at the situation with interest and from different perspectives, sees new opportunities and offers different, original solutions, proactively seeks opportunities to improve his or her quality of life and that of others, knows how to manage the process from creating an idea to implementing it, uses errors as an opportunity for growth, and maintains peace and openness in atypical situations.	4. I accept new challenges in learning the Latvian language, maintaining an emotional balance. 5. Looking at the situation or task from different perspectives, I notice new opportunities in learning the Latvian language. 6. In Latvian language classes, I develop ideas individually and within the group to be used in further activities. 7. I use mistakes and difficulties in learning Latvian as opportunities for growth.
Self-directed learning skills — analyzes the relationship between activity and emotions, personality traits, and behavior, focuses on positive solutions to guide emotions and thoughts, sets short- and long-term objectives, draws up plans for the achievement of objectives and adapts them, uses criteria to evaluate and improve work, gathers lessons learned and uses them in the future, and independently selects, customizes, and applies learning strategies appropriate to the task to be performed.	8. I set personal goals for Latvian hours. 9. I formulate criteria by which I will determine whether the goal has been achieved in the acquisition of the Latvian language. 10. I independently and regularly analyze my activities to achieve the Latvian learning goal.

Collaboration skills — successfully collaborates in both homogeneous and heterogeneous groups, supports and promotes constructive group cooperation, involves and utilizes the diverse knowledge, skills, and experience of a group's members to achieve the best possible outcome, focusing on the common good and the objectives of the group.	11. I communicate respectfully (verbally, non-verbally, and digitally) with others to achieve the Latvian language learning goals set. 12. When performing tasks in Latvian, I collaborate in groups, accepting the diversity of opinions and experiences. 13. I can represent my own interests and respect the interests of others in the acquisition of the Latvian language if the group's and my own needs differ.
Civic participation skills – describes the interactions at local, national, and global levels, explains their involvement in and consequences of multifaceted processes, assumes responsibility for it, offers ideas for and actively engages in societal challenges, engages in activities based on their values and respecting the values of others, and justifies the need for rules, respects them, and encourages change by justifying their necessity.	14. My experience of Latvian language classes helps improve the use of Latvian in the local community (school, interest groups, etc.). 15. I take responsibility for my use of the Latvian language in society according to the situation and general norms of behavior.
Digital skills — effectively exploits digital technologies for different purposes, analyzes the benefits and risks of digital communication, critically analyzes the credibility of information in the media, respects privacy, ethical, and legal conditions when creating content, and assesses, adapts, and follows healthy and safe technology usage habits.	16. I purposefully choose and effectively use appropriate digital technologies to perform tasks when learning the Latvian language. 17. In Latvian lessons, I communicate respectfully in the digital environment according to my own interests and those of others. 18. In Latvian language classes, I learn to observe privacy and legal conditions in the digital environment.

Methodology

Students' transversal skills in the Latvian language subject were assessed with an online survey. In total, six transversal skills were measured: critical thinking and problem-solving skills (3 statements), creativity and entrepreneurship skills (4 statements), self-directed learning skills (3 statements), collaboration skills (3 statements), civic participation skills (2 statements), and digital skills (3 statements). Statements were measured using a 5-point Likert scale (5 = very good, 4 = good, 3 = acceptable, 2 = poor, 1 = very poor).

Table 2. Characteristics of study participants

Grade	**N**	**%**
11	386	55%
12	314	45%
Gender	**N**	**%**
Male	271	39%
Female	404	58%
Other gender or don't want to specify	25	3%
School type	**N**	**%**
Gymnasium	85	12%
Urban school	462	66%
Rural school	153	22%
Level of learning	**N**	**%**
Optimal level	524	75%
Highest level	176	25%

The following steps were taken to obtain the research participants:

1) A list of all Latvian secondary schools containing school names and official email addresses was acquired from the Ministry of Education.
2) An email was sent to all schools with a request to participate in the study from the researchers' official university email. A reminder email was sent to all schools one week later. The email contained instructions on how to organize a survey and a link to the survey.

In total, 700 students from grades 11 and 12 participated in the study (Table 2).

The data was analyzed with descriptive statistics. Cronbach's alpha values were calculated for each transversal skill separately to determine the Likert scales' internal consistency. Mann-Whitney U tests were conducted to determine whether there were statistically significant differences between the self-assessments of students at the optimal level and those at the highest level. Spearman rank correlation tests were also carried out to determine whether transversal skills in Latvian language are connected.

The survey was available on the QuestionPro platform from March 25, 2024 to April 12, 2024. SPSS and Excel were used for data analysis. The study considered all ethical research standards in accordance with the General Data Protection Regulation (GDPR). The questionnaire was anonymous, and participation in it was completely voluntary. Approval for conducting this research was obtained from the Research Ethics Committee of Social Sciences and Humanities of the University of Latvia (14.03.2024. Nr.71–43/41).

Results

Analysis of the Likert scales' reliability allows us to conclude that for all transversal skills, the Likert scales' internal consistency should be considered satisfactory (Taber, 2018) (Table 3).

Table 3. Likert scales' internal consistency

Transversal skill	**Cronbach's Alpha**	**No. of Items**	**Transversal skill**	**Cronbach's Alpha**	**No. of Items**
Critical thinking and problem-solving skills	0,748	3	Collaboration skills	0,771	3
Creativity and entrepreneurship skills	0,799	4	Civic participation skills	0,682	2
Self-directed learning skills	0,843	3	Digital skills	0,801	3

Table 4. Optimal-level students' self-assessed transversal skills

Transversal skills	**Mean**	**Median**	**Standard deviation**	**Skewness**	**Kurtosis**
Critical thinking and problem-solving skills	3,58	3,67	0,64	$-0,18$	1,18
Creativity and entrepreneurship skills	3,48	3,50	0,72	$-0,40$	0,68
Self-directed learning skills	3,06	3,00	0,89	$-0,14$	-0,15
Collaboration skills	3,64	3,67	0,81	$-0,49$	0,45
Civic participation skills	3,79	4,00	0,84	$-0,67$	0,65
Digital skills	3,68	3,67	0,82	$-0,42$	0,32

When analyzing optimal-level students' transversal skills in Latvian language, it can be concluded that five out of the six skills have been self-assessed relatively similarly, but their self-directed learning skills (mean = 3,06, median = 3,00, SD = 0,89) are self-assessed significantly lower (Table 4).

Optimal-level students' self-directed learning skills were also self-assessmed with the highest data dispersion. This indicates a necessity to stimulate the development of self-directed learning skills in Latvian language, especially for those students with insufficient self-directed learning skills, which can lead to an inability to organize learning processes independently (Lāma, 2021). Optimal-level students self-assessed their civic participation skills (mean = $3,79$, median = $4,00$, SD = $0,84$), digital skills (mean = $3,68$, median = $3,67$, SD = $0,82$), and collaboration skills (mean = $3,64$, median = $3,67$, SD = $0,81$) as more developed. The mean self-assessment values for all these skills are above the scales' average. However, none of the mean values can be considered high, considering that the self-assessments were ranked on a 5-point Likert scale.

Table 5. Highest-level students' self-assessed transversal skills

Transversal skills	Mean	Median	Standard deviation	Skewness	Kurtosis
Critical thinking and problem-solving skills	3,68	3,67	0,62	−0, 18	0,33
Creativity and entrepreneurship skills	3,63	3,75	0,64	−0, 58	0,59
Self-directed learning skills	3,27	3,33	0,84	−0, 31	0,29
Collaboration skills	3,79	3,67	0,74	−0, 01	−0, 72
Civic participation skills	4,01	4,00	0,74	−0, 29	−0, 80
Digital skills	3,87	4,00	0,73	−0, 23	−0, 46

When analyzing highest-level students' transversal skills in Latvian language, it can be concluded that the results have a lot of similarities with optimal-level students (Table 5).

Highest-level students self-assessed their self-directed learning skills as less developed (mean = 3,27, median = 3,33, SD = 0,84). Self-directed learning also has the biggest data dispersion, as the standard deviation is greater compared to those of the other transversal skills. Therefore, it can be concluded that, as for students who learn Latvian language at the optimal level, teachers should also focus on learning tasks and structures that promote self-directed learning skill development for students who learn Latvian language at the highest level. Highest-level students self-assessed their civic participation skills (mean = 4,01, median = 4,00, SD = 0,74), digital skills (mean = 3,87, median = 4,00, SD = 0,73), and collaboration skills (mean = 3,79, median = 3,67, SD = 0,62) as their most developed transversal skills. However, these mean values should not be considered very high, and teachers should focus on tasks that promote transversal skill development.

Comparing optimal-level and highest-level students' transversal skill self-assessments, it can be concluded that highest-level students have a greater self-assessment mean value and a greater or equal median for each transversal skill. The differences are statistically significant for five of the six transversal skills (Table 6).

The Mann–Whitney U test indicates that there are statistically significant differences between optimal-level and highest-level students' transversal skill self-assessments for critical thinking and problem-solving skills ($Z = -2{,}00$, $p = 0{,}045$), creativity and entrepreneurship skills ($Z = -2{,}55$, $p = 0{,}011$), self-directed learning skills ($Z = -2{,}79$, $p = 0{,}005$), civic participation sills ($Z = -2{,}68$, $p = 0{,}007$), and digital skills ($Z = -2{,}64$, $p = 0{,}008$). However, the difference between students' self-assessments of their collaboration skills ($Z = -1{,}84$, $p = 0{,}066$) is not statistically significant. This could mean that

Table 6. Mann–Whitney U test results for optimal-level and highest-level students

Transversal skills	**Level**	**N**	**Mean Rank**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Asymp. Sig. (2-tailed)**
Critical thinking and problem/solving skills	Optimal level	524	341,77	179086	41536	−2,00	0,045
	Highest level	176	376,50	66265			
Creativity and entrepreneurship skills	Optimal level	524	339,29	177787	40237	−2,55	0,011
	Highest level	176	383,88	67563			
Self-directed learning skills	Optimal level	524	338,26	177250	39700	−2,79	0,005
	Highest level	176	386,93	68100			
Collaboration skills	Optimal level	524	342,44	179438	41888	−1,84	0,066
	Highest level	176	374,50	65913			
Civic participation skills	Optimal level	524	338,87	177570	40020	−2,68	0,007
	Highest level	176	385,11	67780			
Digital skills	Optimal level	524	338,93	177602	40052	−2,64	0,008
	Highest level	176	384,93	67749			

advanced Latvian language knowledge allows students to understand the manifestation of transversal skills as the language is connected to students' thinking and perception. However, it should be noted that the mean value differences between both student groups in absolute numbers are not very big.

To understand the connection between different transversal skills in the context of the Latvian language subject, a Spearman rank correlation test was carried out (Table 7).

There are statistically significant correlations for all transversal skill pairs, indicating a close connection between all transversal skills. The correlation is moderate or high for all transversal skills (Akoglu, 2018). However, there are

Table 7. Spearman rank correlations between transversal skills

Spearman's rho	Critical thinking and problem-solving skills	Creativity and entrepreneurship skills	Self-directed learning skills	Collaboration skills	Civic participation skills	Digital skills
Critical thinking and problem-solving skills	1,000	0,639**	0,456**	0,463**	0,545**	0,466**
Creativity and entrepreneurship skills		1,000	0,624**	0,564**	0,603**	0,529**
Self-directed learning skills			1,000	0,476**	0,411**	0,453**
Collaboration skills				1,000	0,581**	0,587**
Civic participation skills					1,000	0,585**
Digital skills						1,000

* Correlation is significant at the 0.01 level (2-tailed).

high ($r > 0,6$) and therefore more connected correlations between critical thinking and problem-solving skills and creativity and entrepreneurship skills ($r = 0,639$), civic participation skills and creativity and entrepreneurship skills ($r = 0,603$), and creativity and entrepreneurship skills and self-directed learning skills ($r = 0,624$).

Analyzing the self-assessments of female and male students separately, it can be concluded that female students self-assessed their transversal skills higher than male students, and the difference is statistically significant for all transversal skills (Table 8).

Table 8. Comparison of female and male students' self-assessments

	Male students (N = 271)			**Female students (N = 404)**			
Transversal skills	**Mean**	**Median**	**Standard deviation**	**Mean**	**Median**	**Standard deviation**	**P value**
Critical thinking and problem-solving skills	3,52	3,33	0,62	3,70	3,67	0,60	0,000
Creativity and entrepreneurship skills	3,40	3,25	0,68	3,64	3,75	0,67	0,000
Self-directed learning skills	3,04	3,00	0,86	3,20	3,33	0,87	0,012
Collaboration skills	3,53	3,67	0,78	3,81	4,00	0,76	0,000
Civic participation skills	3,69	3,50	0,79	4,01	4,00	0,76	0,000
Digital skills	3,60	3,67	0,81	3,86	4,00	0,74	0,000

Discussion

In a rapidly changing world, ensuring continuity in learners' achievements in academic and future life activities is essential. The results of this study allow us to better understand optimal- and highest-level students' transversal skill development when learning the Latvian language. Students at both levels self-assessed their civic participation, digital, and collaboration skills as better developed and self-directed learning skills as less developed. Every activity of self-directed learning is self-learning, but not all self-learning is self-directed as elements of self-directed learning — goal setting and planning, self-control, resource selection, evaluation, reflection, and motivation (Lāma, 2021) — are not always implemented. Self-directed learning involves broader student engagement and responsibility for the entire learning process (Curry–Knight, 2023).

One of the reasons students evaluated their self-directed learning skills as less developed might be due to teacher-led learning processes in formal education that do not allow students to develop their self-directed learning skills properly (Morris, 2023). Another might be that these two concepts are often considered synonymous in Latvian education, and when teachers are asked to do their own work, it seems that self-directed learning is taking place at the same time, but in actual fact, self-directed learning strategies are not used, impacting academic self-efficacy (Feraco et al., 2023). It follows from the above

that it is essential to strengthen the development of students' self-directed learning skills in Latvian language at both levels. Analysis of the results also indicates that the approaches, learning methods, and techniques used in the acquisition of transversal skills in the learning process are not differentiated at the optimal and highest levels.

Highest-level students self-assessed all their transversal skills slightly higher than optimal-level students. However, since highest-level students learn Latvian language for one year longer than those at the optimal level, the mean values of highest-level students' transversal skills have not increased sufficiently. In addition, the differences are statistically significant for all transversal skills except collaboration skills. Fewer students tend to choose to study Latvian language at the highest level in Latvian schools than those who learn it at the optimal level. This means that collaboration is likely to develop differently, and sometimes, it is not possible to fully organize group work in the learning process due to the small number of students. The secondary school students' transversal skills in Latvian language are closely interlinked, as indicated by the results of the Spearman rank correlation test, which indicates that there are statistically significant and at least moderate correlations between all transversal skill pairs ($r > 0{,}3$).

Further studies should explore the impact of the Latvian language subject on the development of transversal skills and analyze whether the transversal skills are related to general intelligence.

Conclusions

1. In order for people to be able to adapt and operate successfully in today's changing and challenging world, there is a need for transversal skills to be developed as early as in kindergarten and further developed in school and further careers.
2. At the level of secondary education, Latvian students can learn subjects at the optimal or highest level, which also includes transversal skills.
3. Analyzing the survey data leads to the following conclusions:
    а) optimal- and highest-level students self-assessed that their civic participation, digital, and collaboration skills are better developed than their self-directed learning skills;
    б) highest-level students self-assessed all their transversal skills on average slightly higher than optimal-level students; however, the average difference is small;
    в) for all transversal skills except collaboration skills, the difference between student cohorts (highest vs. optimal level) is statistically significant; and
    г) Spearman rank correlations show that the transversal skills at both levels are closely linked to each other (the relationships between all pairs of transversal skills are statistically significant and at least moderate).

Limitations

Self-assessments risk not being fully representative of students' actual skill development level, as individuals' self-assessments tend to be connected with perception. Other methods, such as observations and objective skill tests, could be applied to further explore students' transversal skills in Latvian language.

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