

JOINT STATEMENT

PARALLEL AUDIT
"DIGITALIZATION IN GENERAL
SECONDARY EDUCATION INSTITUTIONS"



THE ACCOUNTING CHAMBER
Supreme Audit Institution of Ukraine

DER 
PRÄSIDENT
 **HRH**



Table of Abbreviations

ACU	Accounting Chamber of Ukraine
AI	Artificial Intelligence
AIKOM	Automated Information Complex for Education Management
AOS	The All-Ukrainian Online School
BRH	Bundesrechnungshof (Federal Court of Auditors of the Republic of Germany)
GSEIs	General secondary education institutions
HLbG	Hessisches Lehrerbildungsgesetz (Hessian Teacher Training Law)
HRH	Hessischer Rechnungshof (Hessian Court of Audit)
IT	Information Technology
KPI	Key performance indicator
LHO	Landeshaushaltsordnung (Hessian budgetary law)
LUSD	Lehrer- und Schülerdatenbank (Teacher and student database)
MESU	Ministry of Education and Science of Ukraine
SPH	Schulportal Hessen (School Portal Hesse)
VIDIS	Vermittlungsdienst für das digitale Identitätsmanagement in Schulen (School registration service)

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The figures in this joint statement have been rounded for clarity. The calculations are based on unrounded figures, so rounding differences may occur in the calculations.

0 Objectives of the cooperation and the parallel audit

In January 2025, the first parallel audit between the Accounting Chamber of Ukraine (ACU) and the Hessian Court of Auditors (Hessischer Rechnungshof, HRH) on "Civil protection and disaster control" was successfully completed with the signing of a Joint Statement. Building on this cooperation and following a proposal by the ACU, a follow-up project was initiated.

This second parallel audit focuses on the digitalization of general secondary education institutions (GSEIs). It started in April 2025 and ended in February 2026. One of the main reasons for a comparison between Ukraine and Hesse was the fact that Ukraine was already well advanced in terms of the digital public services it provides to its citizens. Despite that, under the extremely difficult conditions of the war, improving the digitalization of educational institutions even further remained a priority. As Hesse also launched programs to improve digitalization in its schools it was decided to perform a parallel audit. This audit is intended to evaluate the implementation and development measures taken by the respective governments to further digitalization.

The Common Position Paper of March 27, 2025, defined the following objectives for the parallel audit.

Article 3

The purpose of the parallel audit is to evaluate whether the responsible authorities of Ukraine and the Federal State of Hesse have implemented projects and measures related to the digitalization in general secondary education institutions correctly, efficiently and effectively. The main goal of this audit is digital technologies and digital competences for the educational process in general secondary education institutions in Ukraine and the Federal State of Hesse.

Article 5

The parallel audit focuses on activities and projects of digitalization of general secondary education institutions.

Special focuses are placed on the following areas:

- 1) information systems / software as a setting for the digitalization of general secondary education institutions;
- 2) hardware equipment as a basis for educational activities;
- 3) in-service training for pedagogical staff on the development of digital competence.

It is intended to compare the approaches to digitalization in general secondary education institutions in Ukraine and the Federal State of Hesse based on the analysis of planning and implementation of relevant measures, as well as user experience.

Parties work on the basis of issues jointly agreed upon in working order.

Article 6

The period covered by the audit in Ukraine is 2021-2024 and in Hesse is 2020-2024. In each case including activities carried out in the previous period if they had a significant impact on the matters subject to audit.

The different framework conditions and financing of digitalization activities and projects were taken into account in the surveys and evaluations. Furthermore, the quantitative educational landscape differed significantly, as Figure 1 shows.



Figure 1: Schools, teachers, and students in comparison; data status as of the beginning of the 2025/2026 academic year (source: own illustration)

1 Parallel audit process and methodology

The promotion of the digital educational landscape at schools in Ukraine and Hesse proceeded differently, particularly regarding the priority areas of funding and the origin of financial resources, see the following table.

Ukraine		Hesse	
Funding from the state budget, funding and co-funding from local budgets, and charitable assistance from international donors and development partners		Funding under the DigitalPact School ¹	
2021-2024		2019-2024	
Procurement of teaching and learning materials for classrooms, computer equipment, and multimedia equipment	EUR 258.70 million	DigitalPact School	EUR 496.3 million
Professional development of teaching staff (including the development of digital competencies)	EUR 40.57 million	Annex I on immediate equipment program for student devices	EUR 50.0 million
Development of the All-Ukrainian Online School (AOS)	EUR 1.99 million	Annex II on administration	EUR 50.0 million.
Operation of the Automated Information Complex for Education Management (AIKOM)	EUR 0.17 million	Annex III on loan device program for teachers	EUR 50.0 million
Overall	EUR 301.43 million	Overall	EUR 646.3 million

Figure 2: Funding amount in comparison (source: own illustration)²

In Ukraine, approximately half of the funds come from the state budget, half from local and regional budgets (co-financing) or is provided in the form of charitable assistance from international and development partners. Hesse's share of the above-mentioned components amounted to 25% (including the municipalities' own contribution), with the remaining 75% being contributed by the Federal Republic of

1 In 2019 the federal and state governments agreed on a collaboration within the so-called "DigitalPact School" to further advance the equipping of schools with digital technology. The federal government provided the states with a total of five billion euros for this purpose over a five-year period until 2024.

2 The average value used for conversion was: UAH 37.64 to EUR 1.

Germany. In contrast to Ukraine, there was no funding from international organizations or similar groups.

To ensure continuous coordination throughout the audit cycle from April 2025 to February 2026, the ACU and the HRH implemented again monthly digital meetings between the Ukrainian and Hessian audit teams. In addition, two comprehensive workshops were conducted in person in Germany, while one was preparatory and one was final nature.

A fundamental component of the audit consisted of surveys conducted at schools. These were designed to evaluate the user satisfaction of both teachers and students regarding the digital infrastructure and tools provided. A large part of the collaboration involved the design and rollout of this measurement tool.

A nationwide survey was conducted in Ukraine among heads of municipal GSEIs, teachers and parents of students. The regional and Kyiv City state (military) administrations disseminated the relevant Microsoft Forms questionnaires.

This approach enabled the level of implementation of measures aimed at enhancing teachers' digital competence (literacy), the availability and adequacy of digital resources, the extent to which online platforms are used for distance learning and the functioning of the AIKOM to be assessed.

According to the results of the nationwide survey, a total of 302,592 respondents participated, including:

- 7,900 school principals (directors), representing 70.4% of the total number of school principals in Ukraine (11,225),
- 78,470 teachers, representing 22% of the total number of teachers nationwide (356,131),
- 216,222 parents of students, representing 6.2% of the total number of students (3,461,522).

In Hesse, surveys were conducted at 31 selected schools, involving school principals, teachers, and parent representatives. All participants were contacted via the schools' email addresses and given the opportunity to complete the surveys.³ Care was taken to include both large and small schools, various school types, and a

³ The following responses were received: 12 school principals, 83 teachers, and 33 parents. The survey was conducted between June and October 2025. The results are not representative due to the response rate. However, they do reflect a snapshot of opinions at a given moment.

geographically balanced selection. Schools in all 21 Hessian districts, all five independent cities, and three cities with special status were included. One school was selected for each of these school authorities, with two each in Frankfurt am Main and Kassel, as significant representatives of southern and northern Hesse, respectively.

Regarding the data collection, certain limitations were encountered in Hesse. The Hessian Ministry of Education was unable to provide separate figures for primary and secondary education on most of the examined topics. That would only have been possible with disproportionately high effort, if at all. Consequently, the HRH had to conduct its analysis at the level of public schools as a whole. However, the HRH only referred to selected secondary schools in the survey results.

2 Main audit findings

The results of the ACU and HRH are presented below.

2.1 Main audit findings of the ACU

The audit of the digitalization of GSEIs, implemented primarily through subventions from the state budget, identified the following key findings:

- **Absence of defined objectives and key performance indicators (KPIs):**

The audit revealed an absence of clearly defined measurable objectives. The absence of KPIs impeded the effective management of digitalization measures and accountability for achieved results.

- **Insufficient alignment of strategic, operational and budget planning:**

Planning documents failed to establish a coherent link between objectives, activities, allocated resources and expected outcomes. This adversely affected the effectiveness of digitalization measures in GSEIs and posed risks of delayed implementation.

- **Funding process:**

Expenditure planning was carried out without adhering to the principle of proper justification. Despite the availability of relevant data, the planning of measures was not based on the actual needs of GSEIs. Information on the condition, age, availability and connectivity of digital equipment was used inconsistently and without a systematic approach.

- **Decentralised implementation of digitalization measures did not ensure their full and timely execution:**

Delays in the disbursement of funds, as well as insufficient coordination between regional state administrations and local budget spending units during the allocation of subventions and the implementation of relevant measures resulted in the partial implementation of the planned measures.

- **Gaps in monitoring and accountability:**

The accountability, monitoring and internal control mechanisms did not ensure the generation of complete, comparable and result-oriented information on the implementation of digitalization measures in GSEIs. Consequently, deviations from

plans and shortcomings in the implementation of relevant measures were not identified or addressed (eliminated) promptly, resulting in the incomplete implementation of planned measures.

- **IT administration:**

The absence of a properly established, systematic IT administration function within GSEIs, combined with significant engagement of teachers for conducting technical tasks, led to teaching staff being assigned non-core responsibilities and an increased workload.

- **Information systems:**

The All-Ukrainian Online School platform supported the Ukrainian education system during the COVID-19 pandemic and the period of martial law by providing distance learning courses for students in grades 5–11. However, it did not ensure equal access to educational materials for all students.

The AIKOM ensured basic digital interaction within the general secondary education system. However, due to the incomplete implementation of its functional capabilities, it did not become a single comprehensive education management system.

- **Overall satisfaction:**

A nationwide survey provided a representative overview of the state of digitalization of education in Ukraine, indicating that school management (administration), teachers and parents are mostly satisfied with the current level of digitalization.

2.2 Main audit findings of the HRH

The audit of the digitalization of Hessian schools, significantly driven by the "DigitalPact School" resulted in the following key findings:

- **Lack of targets and key performance indicators:**

The audit identified a significant lack of measurable targets and sub-goals within the state's digitalization strategy, "Digital School Hesse". The funding program "DigitalPact School" also had these weaknesses.

- **Funding process:**

The current process was found to be highly complex. Every application involved several authorities, among others two ministries and the state's economic development bank tasked with handling every single application and coordinating between each of the involved parties.

- **Fragmented software and hardware landscape:**

Due to the decentralized procurement by individual school authorities, no uniform state-wide software or hardware standard existed. This led to a fragmented IT landscape, which may be influenced by the financial resources of the school authority, resulting in different learning conditions for students.

- **IT administration:**

Some teachers were still frequently burdened with non-educational IT tasks, which diverted resources away from their actual teaching duties.

- **Overall satisfaction:**

According to the surveys, school administrations, teachers, and parents were predominantly satisfied with the status quo of digitalization. Based on individual, non-representative feedback, the "DigitalPact School" proved to be effective.

2.3 Key topic 1: Strategy

2.3.1 Findings of the ACU

Digital transformation of education

During 2021–2024, the measures for digitalization of GSEIs were implemented in the absence of an approved sector-specific strategic document that would comprehensively define objectives, tasks, implementation stages, performance indicators and monitoring mechanisms.

As the central executive authority responsible for formulating and implementing state policy in the field of education, the MESU carried out digitalization measures within the framework of its strategic and operational plans.

However, the MESU did not establish a results-oriented planning system for the digitalization of GSEIs. The absence of clearly defined, measurable objectives and KPIs hindered the effective management of digitalization measures and accountability for the results achieved.

Strategic, operational and budget planning were insufficiently aligned. Planning documents failed to define the necessary set of digitalization measures for GSEIs. The indicators used to assess their implementation were incomplete, failing to provide a means of measuring achievement levels, completion rates, coverage or impact. Furthermore, the MESU's operational plans were not fully aligned with the planned resources.

Planning of budget expenditures for measures to digitalize of GSEIs within the framework of relevant budget programs

The digitalization of schools is financed from several sources, including:

- Subventions from the state budget and co-financing from local budgets.
- Financial and in-kind assistance from international donors and development partners.

At the same time, the planned amounts of budget funding were determined without adequate justification.

According to Article 38 of the Budget Code of Ukraine, the draft State Budget must be accompanied by calculations of the volumes of subventions from the state budget to local budgets, categorised by type and local budget, along with detailed financial and quantitative indicators.

However, the MESU failed to collect information from the regions regarding the necessary subvention funding amounts, and neglected to prepare the requisite financial and economic calculations and justifications. This occurred despite guidance letters from the Ministry of Finance of Ukraine on the preparation of budget requests, which require chief spending units to submit calculations of subvention funding volumes from the state budget to local budgets — whose expenditure is directed towards education — by type and by local budget, together with detailed financial and quantitative indicators.

The planning of subventions was based solely on statistical and analytical data from the AIKOM information system with regard to the number of schools, classes, students and teachers. Despite having AIKOM database information on the number of computers, multimedia equipment, classrooms equipped with interactive surfaces and visualisation tools, and the availability of high-speed wired internet, the MESU did not take this information into account when planning digitalization measures for GSEIs.

Distribution of funding

Financing for equipment procurement and teacher professional development was allocated annually to local authorities based on different criteria:

- in 2021, allocations were determined based on the number of GSEIs, as well as the number of students and teachers,
- in 2022 and 2023, the distribution of equipment to teachers and students, which was supplied through charitable donations, was primarily intended to facilitate distance learning, particularly for socially vulnerable groups in the regions close to the frontline,
- in 2023 and 2024, allocations were based on the number of classes (grades) and teachers.

Funding process

The financing process involved several participants, including the MESU, the Ministry of Finance of Ukraine, the Cabinet of Ministers of Ukraine, local executive authorities and their structural units, executive bodies of local councils, providers of educational services for teacher professional development, GSEIs, the State Scientific Institution “Institute of Educational Analytics”, and the State Institution “Ukrainian Institute of Education Development”.

2.3.2 Findings of the HRH

Digital School Strategy

The “Digital School Hesse Strategy” explicitly links to the state’s overall digitalization strategy. From the HRH's point of view, there are no specific objectives, no concrete sub-goals derived from them, and no key figures for measuring the achievement of objectives. For example, the goal defined in the strategy of “teaching technical and digital skills in all subjects and making targeted use of the potential of digital tools and educational media” is neither specific nor time-bound. This means that the necessary basic requirements for effective strategic management are lacking.

Funding guideline

According to § 23 LHO as well as the corresponding administrative regulations, Hessian budgetary law requires that, when awarding subsidies, the intended purposes and objectives in connection with the use of state funds must be presented. The objectives should be defined with specific key figures in such a way that performance can be monitored. Performance monitoring should be based on specific and measurable targets to check whether and how the desired objectives have been or will be achieved.

The examined funding guideline of the “DigitalPact Hesse” does not define explicit goals or measurable indicators, which makes the monitoring required under budgetary law very difficult or almost impossible.

Distribution of funding

In a report published in 2022, the Federal Audit Office (Bundesrechnungshof, BRH) criticized the federal and state governments for failing to assess the initial situation before launching the DigitalPact School. Instead of conducting a needs-based analysis, the federal government distributed the funds to the states according to the Königstein key⁴. From the perspective of the BRH, both a clear definition of needs and a precise determination of objectives are essential for effective funding.

In Hesse, too, funding was distributed to school authorities exclusively on the basis of the number of students. The Hessian Ministry of Education justified this with the principle of equal treatment: by taking all students into account in the calculations, fair funding for school authorities was to be ensured. This approach is basically understandable, but it does not take into account the heterogeneity of IT equipment in Hessian schools that may have existed before the DigitalPact School.

Educational technical concepts for use

To ensure that technical measures aligned with pedagogical needs, schools were required to develop pedagogical-technical implementation plans, which formed a mandatory part of the funding application.

Principals considered this approach effective but criticized the effort-to-benefit ratio.

Funding process

Including the Ministries of Education and Finance, school authorities, state school offices, and the economic development bank multiple actors were involved in the funding process. This led to an unnecessarily high degree of complexity.

⁴ The “Königstein key“ is a quota system used, among other things, to distribute financial resources among Germany's 16 federal states. It is calculated on the basis of their tax revenues and population.

Efforts should be made to streamline these processes by implementing end-to-end digitalization and reducing the number of administrative bodies involved in the procedure.

The transition to an online portal in the meantime was a step in the right direction because it largely eliminated media discontinuities.

2.3.3 Comparison: Satisfaction with the state of digitalization in general

The surveys conducted in Ukraine and Hesse were also intended to provide a comparative overview of general satisfaction with the current state of digitalization in schools. The results shown in Figure 3 revealed very large differences in the respondents' assessments.

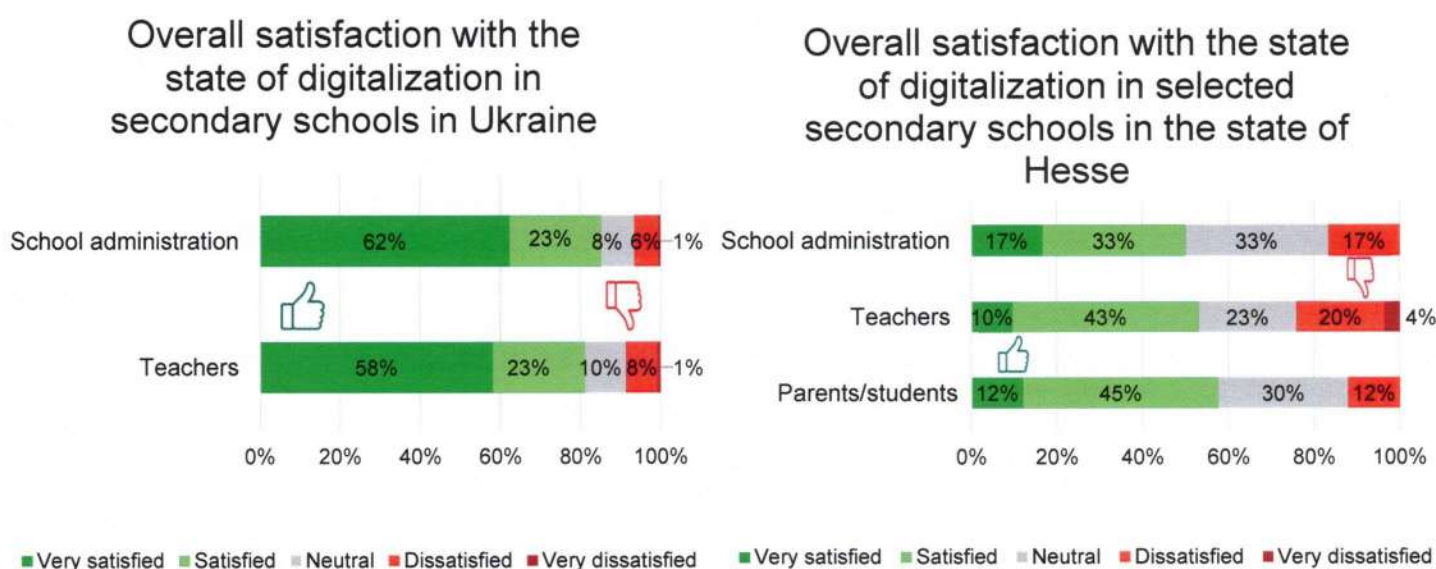


Figure 3: Satisfaction with the state of digitalization in general in comparison (source: own survey data)

In Ukraine, satisfaction with the state of digitalization is remarkably high. A large majority of the school administration gave positive feedback (62% very satisfied, 23% satisfied). The satisfaction of the teachers was at similar levels (58% very satisfied, 23% satisfied). The proportion of both groups who were very dissatisfied or dissatisfied was less than 10%.

Despite this high approval, the ACU notes that the level of equipment of the GSEIs and access to the Internet is insufficient. The main problems according to the

findings relate to the material and technical infrastructure (partially outdated), shortage of devices and the quality of internet connectivity (with most connections below 100 Mbit/s). Although digital technologies are used in the educational process, they are unevenly distributed.

In contrast, user satisfaction in Hesse was more critical and varied. While 50% of the school administration expressed satisfaction (17% very satisfied, 33% satisfied), 17% said they are dissatisfied. Among teachers in Hesse, 53% gave positive feedback, while nearly one in four (24%) expressed dissatisfaction. The figures for parents/students in Hesse show that while 57% were satisfied or very satisfied, 12% remain dissatisfied. An important finding in all Hessian groups is the high proportion of neutral responses. This indicates a clear difference from the more clearly positive feedback in Ukraine.

Nevertheless, the school principals participating in the survey rated the effectiveness of the funding program (DigitalPact School) as high. Almost 80% of participating school administrators considered the DigitalPact School to be effective or moderately effective in general. All participating school administrators stated that students tended to use digital media more frequently than before the DigitalPact School. The number of teachers using digital technology in class, for teaching, and for their work also increased according to this survey.

2.4 Key topic 2: Software

2.4.1 Findings of the ACU

The All-Ukrainian Online School (AOS)

The All-Ukrainian Online School (AOS) is a public, free-of-charge web-based distance learning platform for students in grades 1–11, which has been operational since December 2020.

The purpose of the AOS is to ensure the right of everyone to access distance learning via the Internet through open access to educational materials. The platform contains video lessons, lesson summaries, tests and materials for independent study. In 2020, the MESU ensured the publication of video lessons on the AOS YouTube channel.

During both the periods of lockdown due to the COVID-19 pandemic and martial law in Ukraine, the AOS provided distance learning courses for students in grades 5–11, supporting Ukraine's education system.

However, the AOS does not offer distance learning courses for primary school (grades 1–4) students. Consequently, the right of primary school students to access distance learning through the AOS platform was not guaranteed.

Since September 2022, however, students in grades 1–4 have had the opportunity to study remotely via the AOS mobile application. Nevertheless, this application does not provide these students with full access to education, as it contains lessons in only two of the seven school subjects.

75 % of AOS content, including that on the mobile application, was created with the donor assistance, including UNICEF and other organisations.

Although the MESU established the regulatory framework and organisational arrangements for the AOS, it did not plan for the development and modernisation of the platform using state budget funds, nor did it ensure the updating of distance learning course topics.

The MESU also failed to provide measures to mitigate the risks of the AOS improper functioning in the event of the termination of donor funding.

The Automated Information Complex for Education Management (AIKOM)

The AIKOM is a public information and analytical system designed for the effective management of educational institutions, particularly GSEIs. Established in 2019, the AIKOM functioned in parallel with its modernised version at the time of the audit in 2023–2024.

The purpose of establishing AIKOM was to introduce electronic document management in the general secondary education field. This involved converting administrative reports from GSEIs into electronic form, improving the reliability of educational data and the quality of managerial decision-making. It also involved introducing electronic gradebooks, eliminating the need for paper copies.

In accordance with legislative requirements, all GSEIs in Ukraine must use AIKOM for record keeping and submitting statistical reports.

The AIKOM facilitates basic digital interaction within the general secondary education system, including centralised data collection, processing and protection, electronic reporting, and the operation of essential services. However, due to incomplete implementation, the AIKOM did not become a unified comprehensive education management system.

Consequently, this led to the parallel paper-based document management, imposing an additional workload on teaching staff. Furthermore, GSEIs continued to use commercial educational information systems for school administration, resulting in additional expenditure from local budgets.

Artificial intelligence

Since 2021, the MESU has been a co-implementer of the action plan for the implementation of the Concept for the Development of Artificial Intelligence in Ukraine, running information campaigns to promote AI fundamentals in GSEIs. The Ministry of Digital Transformation is the main implementing body and ensures:

- the improvement of the educational and methodological framework,
- the organisation of training courses for teaching staff on working with data and the fundamentals of artificial intelligence,

- the promotion of digital literacy among students, including the use of digital tools to solve applied tasks, search for information on the internet, protect personal data, and develop media and digital literacy.

According to the survey results, AI is already widely used in education: 85% of teachers use AI tools, primarily for creating materials and assessments. For more details, see section 2.4.5.

2.4.2 Findings of the HRH

Schulportal Hessen

The state provided schools with a central digital solution, the School Portal Hesse (SPH). It includes a learning management system, access to teaching materials, an integrated video conferencing tool, and various features for teachers.

According to information from the Hessian Ministry of Education, around 99% of secondary schools and 93% of primary schools and special schools used the SPH. This is also consistent with the HRH survey: around 90% of participating school administrators stated that they used the SPH. Only a few respondents stated that they were dissatisfied with the school portal. There were isolated complaints that the SPH did not cover all school administration requirements and that additional software solutions were therefore being used. Other software solutions were considered more practical.

Beyond administrative functions, the portal serves as a gateway for educational digital content.

Since the 2017 amendment of the regulation on free learning materials, digital educational media have been equated with textbooks and can be independently procured by schools from the learning materials budget. The total annual budget for learning materials was approximately EUR 24 million.

Within the scope of pedagogical freedom, schools decided independently on the use of educational software and materials. For software that was to be installed on devices belonging to the local school authority, coordination with the authority was required in accordance with the Hessian school law. There was no obligation to report this to the state of Hesse. Accordingly, the Hessian Ministry of Education does not have an overview of the educational software and materials being used.

Lehrer- und Schülerdatenbank

The Teacher and Student Database (LUSD), developed by the Ministry of Education, is used to manage student, teaching, performance, and teacher assignment data.

The LUSD stored the data centrally at the Hessian Data Processing Center and provided schools with a shared and constantly updated database. This was intended to support processes in schools and relieve teachers and school administrators of many administrative tasks. The effort required for data maintenance was to be reduced because master data could be transferred from school to school “throughout the school career.” An interface was used to automatically transfer data on children starting school from the municipal registration authorities.

Data maintenance in the LUSD was mandatory for all general education and vocational schools in Hesse and was carried out by school administrators, teachers, and secretaries.

Artificial intelligence

After several delayed launches “Telli”, an AI chatbot, has been available free of charge at all general education schools since October 1, 2025. The state of Hesse covers the central infrastructure and operating costs.

According to the information provided, a particular focus was placed on data protection and legal certainty during development. Registration in Telli was therefore pseudonymized via the school registration service VIDIS. Data was not to be used for training the language models. In addition, no data was to be passed on to third parties. The widespread introduction of Telli is also closely linked to an accompanying training program offered by the Hessian Teachers' Academy. This is intended to enable teachers to use AI competently, safely, and pedagogically effectively.

However, the additional freedom schools have to choose their own AI tools can lead to a fragmented digital landscape.

Work Email System

Since the 2020/21 school year, all teachers in Hesse have been provided with official email addresses. The use became mandatory in the following school year 2021/2022. Teachers were required to set up the account and check their emails regularly.

The survey shows that almost a third of the teachers did not use their official email. Furthermore, only a third of the teachers were (very) satisfied with it, while almost half were (very) dissatisfied. A complicated login process and an existing school email address were named as reasons for dissatisfaction or non-use by some of the teachers.

In contrast to Hesse in Ukraine was no work email system with a centrally provided official email address for all teachers.

2.4.3 Comparison: Satisfaction with AOS in Ukraine and SPH in Hesse

The surveys conducted in Ukraine and Hesse provided a comparative overview of user satisfaction with the AOS in Ukraine and the SPH in Hesse. The results in Figure 4 show some significant differences in the satisfaction level between the target groups surveyed in both regions.

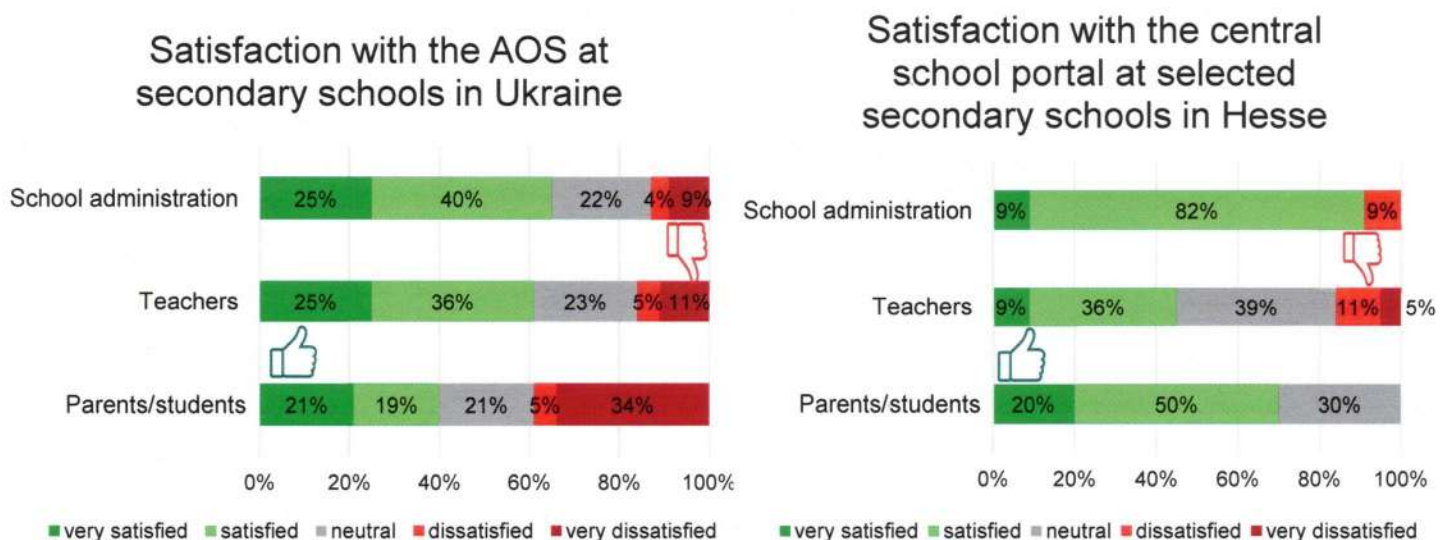


Figure 4: User satisfaction with AOS and SPH in comparison (source: own survey data)

In Hesse, satisfaction among respondents was generally high across all groups. A large majority of school administrators (82% satisfied, 9% very satisfied) gave positive feedback. Teachers in Hesse also showed a generally high satisfaction rate (36% satisfied, 9% very satisfied). From parents and students in Hesse came besides the neutral ones only positive responses: 50% were satisfied and a further 20% were very satisfied with the school portal.

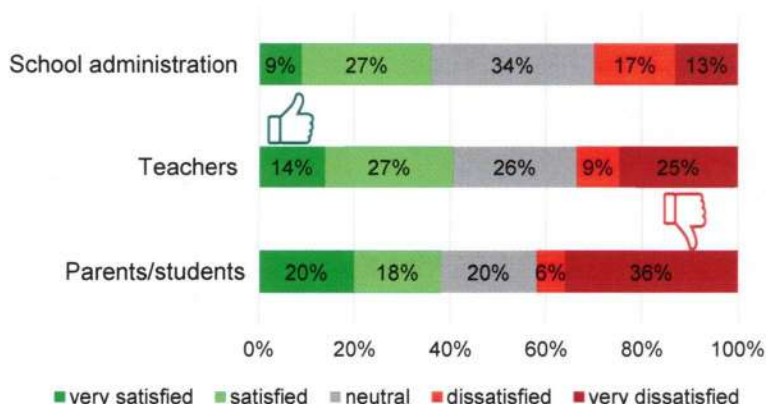
By contrast, user satisfaction with the national online portal was generally lower in Ukraine. While school administrators and teachers were generally satisfied, parents and students were considerably more critical. Overall, 39% of parents and students expressed their dissatisfaction or strong dissatisfaction, which differs significantly from the results observed among their counterparts in Hesse.

These findings highlight the different experiences and specific challenges faced by the respective user groups within their national contexts. Ukrainian students tend to be more critical of the AOS, as they can compare the platform and its lessons with those of other private providers. At the same time, school administration and teachers tend to favor the public resource.

2.4.4 Comparison: Satisfaction with the AIKOM in Ukraine and LUSD in Hesse

The surveys conducted in Ukraine and Hesse provided a comparative overview of user satisfaction with the AIKOM in Ukraine and the LUSD in Hesse. In Figure 5 some significant differences in the satisfaction level become visible.

Satisfaction with AIKOM at secondary schools in Ukraine



Satisfaction with the LUSD at selected secondary schools in Hesse

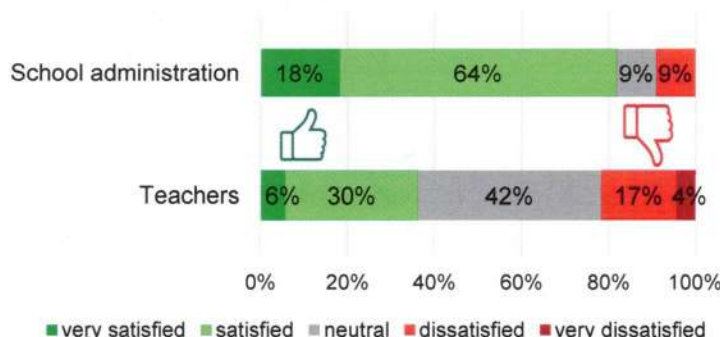


Figure 5: User satisfaction with the AIKOM and LUSD in comparison (source: own survey data)

The level of satisfaction with the use of AIKOM amounted to 36% among school administrators, 41% among teachers, and 38% among parents (students) who were surveyed regarding the use of one of AIKOM's modules—the electronic gradebook and diary. However, parents (students) expressed a significantly higher level of dissatisfaction with the use of AIKOM in relation to the electronic gradebook and diary, which confirms the low demand for these tools among students.

In Hesse, the participating school administrators and teachers rated their satisfaction with the LUSD as mixed. 82% of participating school administrators and 36% of participating teachers were very satisfied to satisfied. 9% of school administrators and 42% of teachers rated the LUSD as neutral. The participating teachers rated the LUSD more heterogeneously overall than the school administrators. While 9% of school administrators were (very) dissatisfied with the LUSD, around 21% of teachers were (very) dissatisfied. The use of LUSD by parents/students was not intended in Hesse.

2.4.5 Comparison: Use and familiarity of artificial intelligence

The surveys examined if teachers used AI tools and for what kind of purposes they were used. The results indicated that 85% of teachers in Ukraine and 76% of teachers in Hesse used some kind of AI tool. Figure 6 shows for which teaching purposes AI was used.

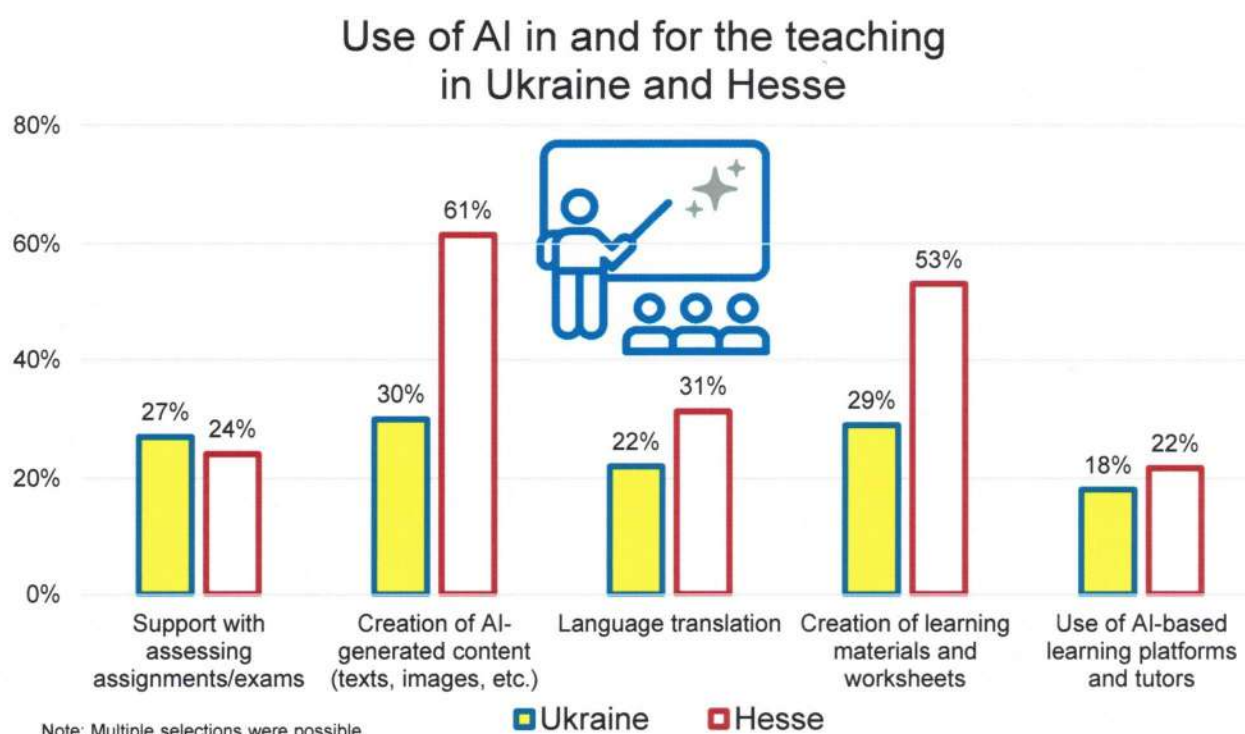
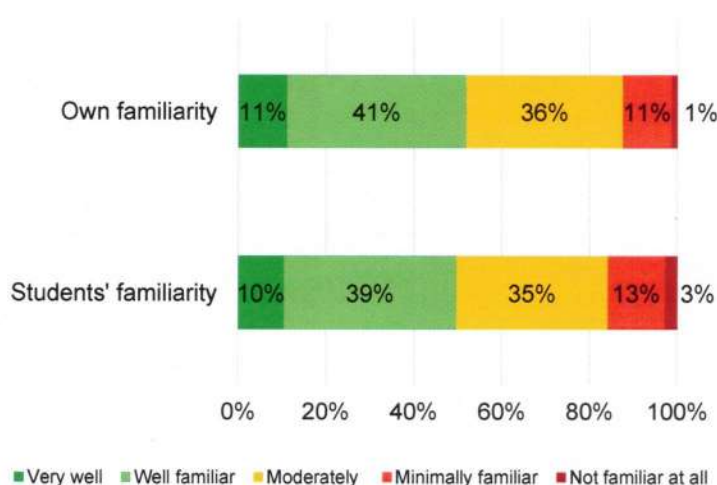


Figure 6: Use of artificial intelligence in secondary schools in comparison (source: own survey data)

While generally more teachers in Ukraine used any kind of AI tool (85% in Ukraine vs. 76% in Hesse), the results presented in Figure 6 show that the range or number of tools used by a single teacher seems to be higher in Hesse as compared to Ukraine. With the exception of using AI to assess assignments, all of the other possible fields of application were used more frequently by the teachers in Hesse. Using AI to create content (such as texts and images) (Hesse 61% vs. Ukraine 30%) and using AI to create learning materials and worksheets (Hesse 53% vs. Ukraine 29%) were application methods used especially often in Hesse as compared to Ukraine.

In order to be able to use AI effectively, a certain degree of familiarity with the available tools and competence in using them is necessary. Therefore, the surveys asked the teachers to assess their own familiarity as well as their perception on their students' familiarity with AI when it comes to using it. The results are shown in Figure 7.

Perception of teachers in Ukraine on own familiarity and students' familiarity with using artificial intelligence



Perception of teachers in Hesse on own familiarity and students' familiarity with using artificial intelligence at selected secondary schools in Hesse

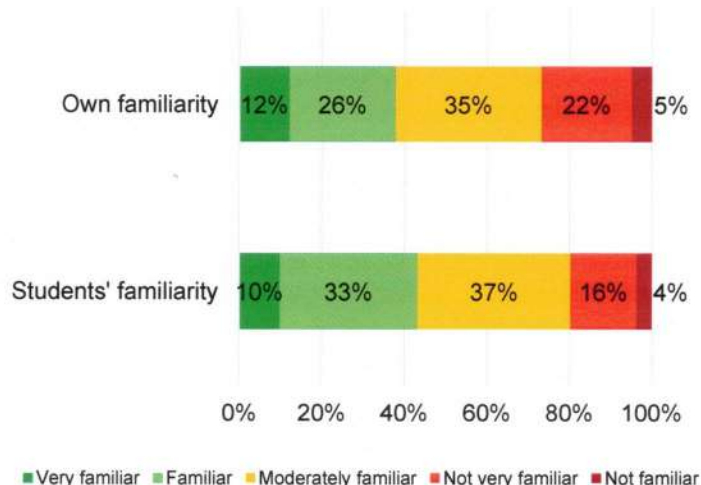


Figure 7: Teachers' perception on own and students' familiarity with using artificial intelligence in comparison (source: own survey data)

The results and perceptions were generally very similar in both Ukraine and Hesse, although a slightly different assessment on which generation is more familiar with AI can be seen. In Hesse, teachers perceived their students to have a slightly higher degree of familiarity than themselves in terms of AI. In Ukraine, the opposite was seen, as teachers rated themselves to be slightly more familiar than their students.

2.5 Key topic 3: Hardware

2.5.1 Findings of the ACU

Funding items

During 2021–2024, GSEIs in Ukraine were provided with computer equipment and multimedia devices through several sources of financing:

- interbudgetary transfers from the state budget to local budgets (balances of the education subvention, the COVID-19 response subvention, and «The New Ukrainian School» subvention), with co-financing from local budgets,
- international technical assistance,
- charitable assistance financed from local budgets.

In total, no fewer than 395,258 units of such equipment and devices were supplied, amounting EUR 258.7 million. This included:

- 62,674 laptops for teachers,
- 4,135 sets of multimedia equipment,
- 14,561 multimedia/interactive whiteboards,
- 11,321 interactive surfaces, visualization tools,
- 42,366 units of computer equipment for equipping classrooms (laptops, personal computers and Chromebooks),
- 260,201 Chromebooks, tablets and laptops financed by international donors, development partners and local budgets (charitable in-kind assistance).

Standards

Standard lists of computer equipment for GSEIs and lists of teaching aids and equipment for STEM classrooms and laboratories have been approved at the national level. These lists are mandatory for all GSEIs when procuring equipment.

They set out standard specifications for computer hardware and devices in classrooms, including technical details, compliance documentation, warranties, and operational support. They also set out the requirements for teaching aids and classroom equipment in line with modern educational technologies.

Student devices

There is no separate program for providing students with devices.

Chromebooks and tablets are provided to students for distance learning, primarily in regions close to the areas of active hostilities, mainly with the support of donors and development partners. These partners have provided 146,369 devices, amounting to EUR 38.6 million.

Teacher devices

In 2021 only, a program was implemented to procure 62,674 laptops for teaching staff to support distance learning as part of measures to address COVID-19 pandemic, achieving a ratio of one laptop per teacher.

The state budget funds used for procuring these laptops amounted to EUR 29.7 million.

In subsequent years (2023 and 2024), funding was directed towards equipping classrooms in GSEIs, with the exception of primary school classrooms.

In addition, thanks to international donors, 99,290 tablets, Chromebooks and laptops for teachers worth EUR 39.7 million were delivered from 2022 to 2024. These deliveries are primarily directed to oblasts located close to the areas of active hostilities.

2.5.2 Findings of the HRH

Funding items

In addition to establishing and improving the school network infrastructure, the following hardware categories, among others, were initially funded:

- School-based mobile devices, such as tablets and laptops
- Display and interaction devices, such as interactive whiteboards, projectors, and so on
- Digital work tools, such as document cameras

An evaluation of the funding list shows that the procurement of almost 90,000 devices was initially funded in the categories listed above.

Standards

No common technical standards or hardware criteria were specified in the administrative agreement between the federal and state governments, the Hessian DigitalPact School Law, or the Hessian funding guidelines.

The HRH considers that the establishment of a common standard would help to ensure optimal hardware equipment and prevent fragmentation of the IT landscape.

Student devices

The immediate equipment program for student devices (Annex I) aimed to provide devices which school authorities could loan to students in need who did not have their own digital device. Around 95,000 mobile devices were procured for a total of 808,000 students.

The volume of Annex I amounted to EUR 50 million.

Teacher devices

The program for teachers (Annex III) procured around 73,000 loan devices for approximately 67,000 teachers, meaning that theoretically each teacher has more than one device at their disposal. However, this does not necessarily mean that every teacher received a device.

The volume of Annex III amounted to EUR 50 million as well.

The HRH's survey results show an overall positive picture from the perspective of participating teachers, indicating that the funds from the DigitalPact School have advanced the digitalization of schools and supported teachers in their work.

2.5.3 Comparison: Frequency of hardware use

Within the surveys, ACU and HRH wanted to see if there are differences in how frequently teachers utilize various types of hardware during lessons. The results are shown in Figure 8.

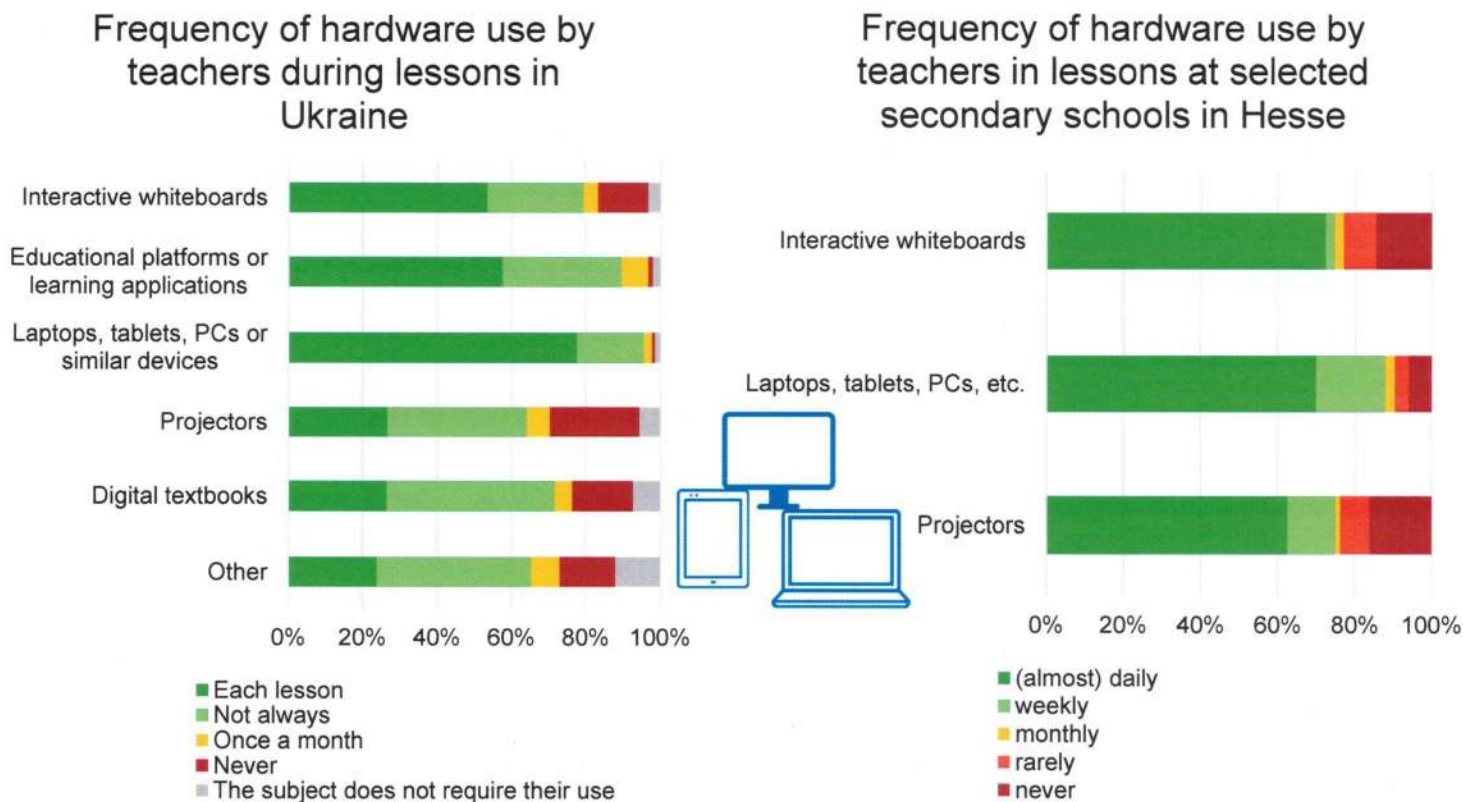


Figure 8: Frequency of hardware use (source: own survey data)

Overall, while the (almost) daily use of individual devices like laptops in Hesse is high (70%), it does not reach the level of almost continuous use in Ukraine, as 78% of teachers reported to use laptops in every lesson.

2.5.4 Comparison: IT administration

Investments in digital infrastructure are increasing the scope and demands of IT administration and support in schools. With this in mind, ACU and HRH investigated whether and to what extent teachers are being assigned tasks that are the responsibility of the school authority. The results on the IT administration are shown in Figure 9.

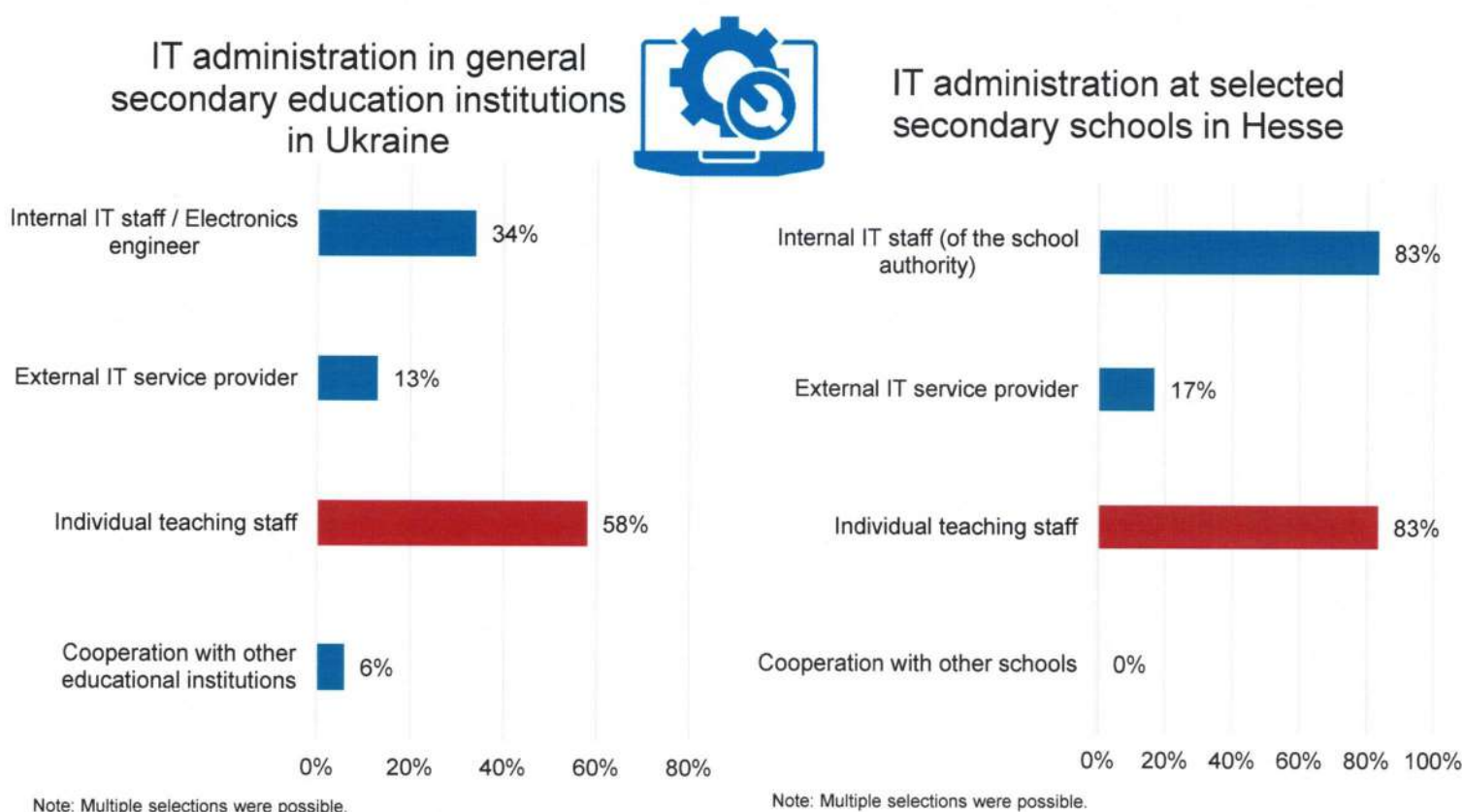


Figure 9: IT administration in comparison (source: own survey data)

Responsibility for providing technical support for the IT infrastructure in schools in Ukraine is assigned to an electronics engineer, a position that may be established in each educational institution.

It has been found that in both Ukraine and Hesse, at least some teachers play a major role in IT administration. When such tasks are carried out by teachers, they are absent from the classroom. The states should work to ensure that teachers do not perform school authority tasks in IT administration, but are instead deployed in the classroom with the appropriate amount of time. Teachers should only be involved in IT administration when pedagogical concerns are directly affected.

2.6 Key topic 4: Teacher training and continuing education

2.6.1 Findings of the ACU

Legal manifestation / Digital skills and training

The MESU has approved standard professional development programs for teaching staff, which are aimed at developing digital competence. These programs are also available to teachers and heads of GSEIs implementing the new State Standard of Basic Secondary Education (grades 5-9), and they include modules focused on developing digital competencies.

Teachers' digital competence (literacy) was developed within programs approved by the MESU and through regional institutes of postgraduate pedagogical education, which were the main providers of these training programs.

A total of EUR 38.2 million was spent on the professional development of teachers, including the development of digital competence, of which EUR 7.6 million was financed from the state budget.

In addition, with the support of international partners, courses for teachers on developing digital competencies have been implemented in Ukraine. During 2021–2024, more than 100,000 teachers were trained annually in 22 programs.

A survey of 78,470 teachers from all regions of Ukraine demonstrated that teachers in Ukraine have a high level of digital literacy and are ready for innovation.

85% of teachers have completed digital competence training during the past two years.

2.6.2 Findings of the HRH

Digital skills and training

Digital education was anchored in all phases of teacher training in the Hessian Teacher Training Law (HLbG), including university education, preparatory service, and career entry.

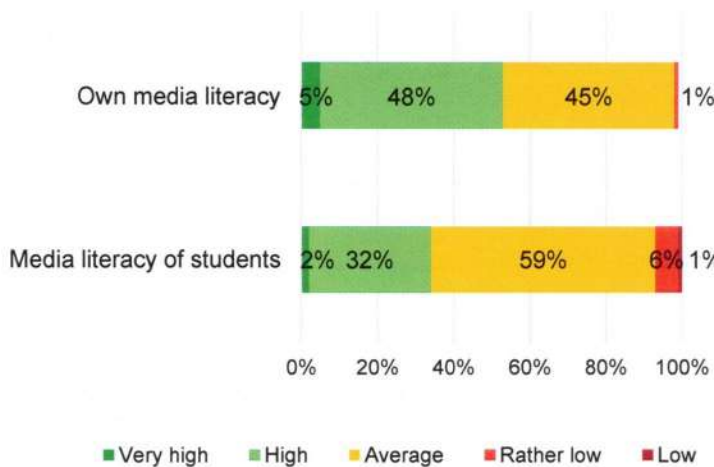
According to information from the Ministry of Education, contracts were in place between the Hessian Teacher Academy and all universities in Hesse to ensure uniform implementation of relevant measures. These included cross-phase modules and qualification programs that systematically integrated digital education into teacher training. The inter-university network HessenHub (Network for Digital University Teaching in Hesse) also played a central role in the further development of digital education. Among other things, it developed a qualification framework for digital education in teacher training, using a “digital literacy” competency model. This model was designed to teach digital skills in areas such as communication, collaboration, digital testing, AI, and adaptive learning systems in a step-by-step manner. In addition, almost all universities in Hesse offered corresponding qualification programs for teaching students: online self-study modules, e-portfolios, subject-specific didactic seminars with a digital focus, and lecture series.

According to the survey, two-thirds of teachers had already completed training on the use of digital media. While there is still demand for further training, it is lower than for media literacy and especially AI. Overall, additional training needs were identified.

2.6.3 Comparison: Assessment of media literacy by teachers

While teaching competence in the field of digital education refers to the ability of teachers to select digital tools and content in a didactically meaningful way and integrate them into their lessons, media literacy describes basic knowledge and skills in dealing with digital media and their reflective use. High digital teaching competence therefore requires sufficient media literacy. It is also a prerequisite for being able to specifically promote media literacy among students. For this reason, both the ACU and the HRH asked teachers to assess both their own media literacy and that of their students. The results of the survey are shown in Figure 10.

Assessment of media literacy by teachers in Ukraine



Assessment of media literacy by teachers at selected secondary schools in Hesse

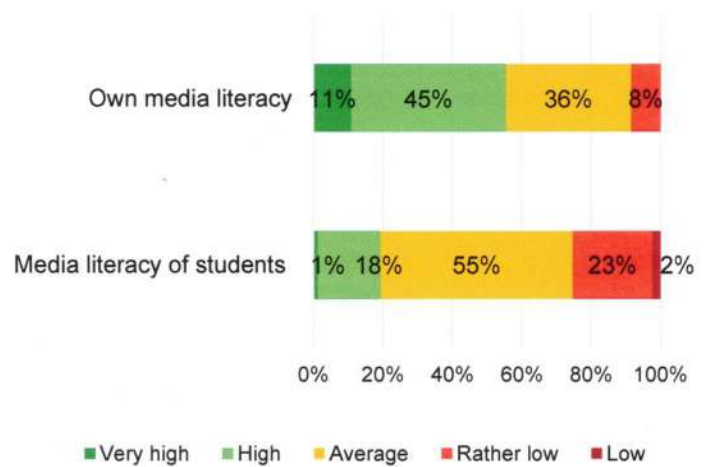


Figure 10: Assessment of media literacy by teachers in comparison (source: own survey data)

In both Ukraine and Hesse, the majority of teachers rate their own media literacy slightly above average, while they tend to be more cautious when assessing the media literacy of their students. This suggests that there is still a need to further develop the teaching and application of digital media literacy skills.

The ACU emphasizes that its survey has revealed that digital competence and media literacy are the most important and in-demand areas of professional development for teachers. Almost all educational institutions include these topics in their plans, and a significant proportion of teachers have already completed relevant modules. As one of the most popular thematic areas, teachers actively proposed and participated in media literacy training. Teachers apply the digital and media competences they have acquired in their practical work, as reflected in the high proportion of positive responses.

3 Derived recommendations

3.1 Key recommendations of the ACU

In order to ensure measurable, timely and sustainable improvements for GSEIs, teachers and students, systemic changes are required, with clearly defined responsibilities at each level of governance.

Shift from activity-based management of digitalization to results-based management: digitalization should be implemented as a results-oriented transformation rather than as a set of individually financed measures. This requires the establishment of clear objectives, measurable key performance indicators (KPIs), defined implementation stages, and accountability for achieved outcomes, rather than accountability limited to budget execution and procedural compliance.

Align planning, financing and implementation of digitalization measures with actual needs: planning and resource allocation should be based on verified data regarding the needs of GSEIs and their implementation capacity. Education management information systems should serve as primary tools for evidence-based decision-making and priority setting, ensuring that resources are directed to areas where they can generate the greatest impact.

Ensure coherence and sustainability of digital solutions: digital platforms and information systems should operate as an integrated, accessible and resilient ecosystem. To avoid duplication of processes and dependency on ad hoc or donor-driven solutions, clear institutional mandates, interoperability requirements and predictable financing mechanisms should be established.

3.2 Key recommendations of the HRH

The HRH identified significant potential for optimization regarding the "Digital School Hesse" strategy and its implementation. The "Digital School Hesse" strategy currently lacks concrete and measurable objectives as well as defined sub-goals. The HRH recommends establishing a clear target structure. Also the funding guideline should include measurable targets, forming the basis for a systematic evaluation of its success.

The audit found the current funding procedures to be relatively complex. Efforts should be made to streamline these processes by implementing end-to-end

digitalization and reducing the number of administrative bodies involved in the procedure.

The user assessments gathered through the HRH's surveys should be directly integrated into the further development of the central school portal and other centrally provided software applications.

To ensure optimal hardware equipment across all Hessian schools, the HRH advises the State to strive for standardization in cooperation with the school authorities. This would prevent the quality of equipment from depending primarily on the financial potential of individual school authorities and avoid further fragmentation of the IT landscape.

Given the ongoing digitalization, professional IT administration is essential. Teachers must be relieved of non-pedagogical tasks, specifically IT administration, to ensure they can focus on their core educational responsibilities.

3.3 Joint conclusion of ACU and HRH

The parallel audit has achieved its goal. Both the ACU and the HRH have examined the key issues agreed upon in the Common Position Paper. Recommendations were formulated based on the data and facts collected, supplemented by the results of the surveys. This marked the successful continuation of the trusting cooperation between the two institutions.

The digitalization of the education sector should be implemented as a results-oriented transformation rather than a series of individually funded measures. This requires a strategy, in which clear goals are defined. This strategy must also allow for the definition of KPIs. KPIs will ensure the establishment of measurable goals and expected results (degree of implementation, level of coverage of measures, their impact), an objective assessment of the achieved results, the connection between the amount of funding and the achievement of results, and transparency of activities.

In order to implement the measures efficiently, the resources must be allocated according to the needs. The process of applying for, requesting and receiving funds should not be too complex.

Changing approaches to planning and financing digitalization measures will ensure their formation taking into account the actual needs of schools and improve the efficiency of financing processes.

In order to avoid the performance of inappropriate functions, teachers in Ukraine and Hesse should not be involved in tasks such as IT administration or data maintenance. Generally, it should be ensured that teachers can focus on their core education responsibilities.

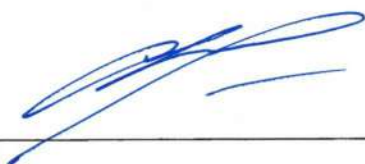
ACU and HRH intend to continue their cooperation and exchange of experience and expertise in the broader European context, thereby further strengthening ties between Ukraine and Western European partners and institutions.

Kyiv / Darmstadt

3rd of September 2026

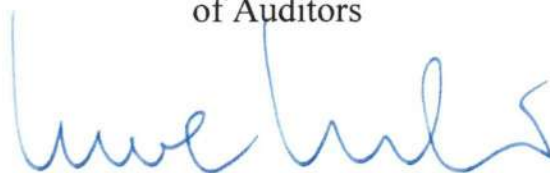
Olha Pishchanska

Chairwoman of the Accounting Chamber
of Ukraine



Uwe Becker

President of the Hessian Court
of Auditors



4 Glossary

The Automated Information Complex for Education Management (AIKOM) is an integrated hardware and software system and an electronic education management system designed for the collection, storage, management and use of data in the education sector, enabling informed and effective managerial decision-making. The system generates educational statistics and ensures its monitoring through its advanced functional capabilities.

The All-Ukrainian Online School (AOS) distance learning web platform is a national digital platform that provides free-of-charge educational content developed by expert teachers in accordance with the national curriculum (programs) and offers a scalable and inclusive solution for blended and distance learning.

Königsteiner Schlüssel (Königstein Key) is used to distribute funds and tasks among the federal states in Germany. The key is calculated using one third of the population share and two thirds of economic strength, measured in terms of tax revenue.

Lehrer- und Schülerdatenbank (LUSD) was developed by the Hessian Ministry of Education and was also used in other federal states to manage data on pupils, lessons, performance and teacher assignments. In addition, it was used to check course enrolments and even admissions to A-levels, secondary school and intermediate school qualifications. It provided basic data for planning and statistics as well as for printing school reports.

Schulportal Hessen (SPH) is the central, data protection-compliant digital learning and working platform for schools in Hessen. It offers tools for everyday school life, including class registers, grade management, timetables, communication and Moodle. Teachers, pupils and, in some cases, parents can access the portal via a uniform login system.