FINLAND

Report on methods for holistic literacy and emerging technologies (ET) in Adult Learning and Education (ALE)

Emerging Technologies for Holistic Literacy in Adult Education

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Desk research findings

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Policy Frameworks

There are several recent education policies, strategies and reports linked to literacy and digitalisation of education in Finland. In 2025, the Finnish National Agency for Education and the Ministry of Education and Culture published guidelines for the use of AI in all levels of education in Finland, including liberal adult education. The goal of the guidelines Artificial Intelligence in Education – Legislation and Recommendations is to support education providers in making use of AI as part of teaching and learning. The material consists of two parts: obligations and recommendations, as well as background materials that provide context for them.

The aim of the **Digital service package for continuous learning** is to produce a customer-oriented and flexible service package that crosses administrative boundaries and supports individuals in making education and career choices and maintaining and developing their competence throughout their careers. The goal is to accelerate the reform of the education system and employment services by building an interoperable and integrated digital operating environment and new services which meet the customer's needs optimally. The target groups are individuals, career counsellors, working life actors and education providers, companies and actors in the labour and educational administrations.

The Finnish National Agency for Education has issued a decree on national **digital badges** that focus on basic skills. These badges can be used to identify, recognise and make visible broad, generic and general competences, such as those needed in working life. The Agency has defined the learning objectives and assessment criteria for the badges based on competences. Providers of liberal adult education may act as issuers of the badges. The national basic skills digital badges are divided into six thematic areas:

- learning skills
- literacy skills
- numeracy and financial skills
- interaction and workplace wellbeing skills
- digital skills
- sustainability competence

The National Literacy Strategy 2030 describes the measures that should be taken in Finland to strengthen multiliteracy. The vision of the Literacy Strategy – Finland - the most multiliterate country in the world in 2030 – aims for a society in which the importance of literacy is acknowledged widely in all sectors and everyone’s literacy skills will be supported and strengthened throughout their life. The strategy also presents a mission: A literary way of life is the basis for equality, education and well-being. The three guidelines of the National Literacy Strategy are 1) Creating and strengthening structures for literacy work, 2) Strengthening multiliteracy competence, and 3) Encouraging reading and diversifying literacy.

The **National Literacy Program** (formerly The Literacy Movement) is an ongoing governmental program aimed at promoting the literacy of Finnish residents, especially children and young people. The Literacy Program emphasises diverse literacy, not limited to a specific text type. New types of technology are changing our everyday life, work and, inevitably, our reading habits and texts. The Programme uses the term multiliteracy, which includes interpreting and evaluating the content of the text. Multiliteracy also involves the ability to absorb and convey information, identify emotions, and understand the use of language and contexts.

The National Agency for Education and the Ministry for Education and Culture coordinate several development programs which are linked to the above-mentioned policies.

Recommendation for the Literacy Education Curriculum in Liberal Adult Education (2017), intended for immigrants, is designed to support curriculum design in liberal adult education institutions. The recommendation can also be used in other similar literacy education programmes. The National Agency for Education recommends that education providers develop their own curricula based on this recommendation.

The Finnish Education Evaluation Centre (FINEEC) carried out an **evaluation of literacy training** for immigrants in 2022. The evaluation applied to liberal (non-formal) adult education and basic education for adults. The evaluation produced information to support the planning, implementation, assessment and development of literacy training for immigrants. Some key conclusions were:

- Rather than by the student's needs, access to the training is determined by the length of their residence in Finland and their labour market status.
- Competence assessment methods and criteria vary, which puts students in an unequal position
- The practices of directing students to the training, as well as the ways in which information is stored and transferred, are varied and partly inadequate
- The impact of literacy training is undermined by a lack of interaction and language practice outside the school.

Recommendations from the evaluation: The evaluation recommends expanding access to literacy training by removing the requirement for an integration plan and extending funding to all who need it. Assessment practices should be standardised nationally to ensure fairness and better identification of learning needs. Guidance and information sharing between institutions and authorities must be improved through interoperable systems. Support structures should be strengthened for students who progress slowly or have learning difficulties, with stable funding and flexible study options. Finally, integration should be enhanced by encouraging language use outside school and developing national methods to track the broader impact of training on well-being and social inclusion.

Funding of Emerging Technology Initiatives

There is no specific programme to fund the use of emerging technology in adult education in Finland. However, the National Agency for Education and the Ministry of Education and Culture have several programmes that fund new initiatives and projects in adult education centres, universities, NGO's, libraries, etc. They also coordinate ESF funding for education initiatives. Digitalisation and basic skills are common topics among these initiatives. They also fund the degree education of teachers in universities, as well as further education programmes. Many of the teacher education programmes nowadays include learning about the use of emerging technologies.

The National Agency for Education also has several material banks and instructions for educators on how to use emerging technology in teaching, as well as ethical guidelines. For example, this is a material bank on how to use AI in basic education.

Best Practices

With the emergence of new technologies, the practices and demands of working life will continue to change in the future. Therefore, competence in using and applying XR technologies, learning analytics, artificial intelligence, and game engines will become essential skills in future teaching. Häme University of Applied Sciences, together with the Tavastia Vocational College Consortium and the Kiipula Foundation, has launched project Curious 1.0 – Inspiring learning and teaching through new technologies. The primary target group includes teachers, guidance counsellors, and development staff in upper secondary education institutions, as well as teachers and counsellors in liberal adult education. Kiipula is a special education vocational school, so the project will also produce knowledge on how new technologies work with vulnerable learners.

The PerusSetti project (2020–2022) developed digital learning solutions tailored to the needs of adult basic education. The aim was for students to begin practising the use of various devices and digital materials right from the early literacy phase. The project created a digital learning framework for the different stages of adult basic education, which can be applied on a national level. Some of the games and learning tools use AI.

Game on-Level up! Erasmus+ project focuses on enhancing and developing the teaching staff's pedagogical gamification skills through new digital technologies, especially VR and immersive technologies. With these enhanced skills, teaching staff will be able to create more engaging and motivating learning content suitable for all levels of learners, addressing the emerging needs of the modern work environment. The project has developed a course for educators. By completing this course, educators gain valuable expertise in gamified learning, helping them create engaging, immersive, and effective training experiences for their students. The project has also developed six innovative virtual educational games designed to enhance students' soft and transversal skills.

FCLab.fi (Future Classroom Lab) is a unique network of teacher training schools and universities to develop new learning environments, promote educational technology and diversify pedagogical models.

The project is active in several lower and upper secondary schools. For example, in Helsinki teacher training school (Norssi), the project organised a workshop for 19 students. The students' task was to create a story, fairy tale, poem, backstory or other similar written piece either individually, in pairs or in small groups using AI tools, and to produce suitable illustrations for it.

The Kaikkien malli is a holistic educational model designed to support the development of basic skills. A group is formed around a shared theme. The aim may be, for example, to strengthen personal finances, a sense of inclusion and wellbeing, as well as participation in education and employment. Learners' needs are identified to ensure the activities help improve their everyday lives. Basic skills – literacy, numeracy and digital skills – are integrated into solving everyday challenges.

Furthermore, there are important examples of networks and projects related to emerging technologies in education. They mostly focus on basic or higher education. Several Finnish universities have launched the **Generation AI** project. The project brings together technology developers, researchers, schools, public authorities, businesses and NGOs. It strengthens children and young people's ability to cope with the global societal impact of technology and provides teachers with pedagogical tools to address the transformation of learning. The project will produce and sharpen scientific understanding that will enable education and training solutions to meet the skills needs of the AI generation.

The **Innokas Network** guides schools towards creativity and innovation through technology. Today, over 600 Finnish schools participate in the Network. The network encourages schools to arrange their own activity that supports the learning of 21st Century Skills and to participate in education development. "Our network forms a unique live lab that allows us to study new educational innovations in a practical school context." The network is coordinated by the Faculty of Educational Sciences at the University of Helsinki in collaboration with 10 regional coordinators.

Since 2016, **digital tutoring** has been systematically developed and organised in Finnish schools, with government grants supporting the activities. The publicly funded projects ended years ago, but the practice continues in Finnish schools as a local activity, funded by the municipalities. It is widely considered a very well-working practice. The digitutor is a teacher themselves, and they have some allocated time to help other teachers and develop their digital skills. This allows the tutor to become familiar with the school's individual teachers and better understand their specific tutoring needs. When the work is integrated into the school's everyday teaching, it becomes easier for teachers to ask for help. Having support available on-site lowers the threshold for asking for help, especially among those teachers who might otherwise find digital training burdensome. The good practices of digital tutoring could also be extended to other forms of tutoring and peer teaching, for example, in areas such as social and emotional skills, multiliteracy, and entrepreneurship education.

For digital tutoring to succeed, it requires support not only from school leadership but also from the broader education and cultural services sector. When principals value the work of tutors, it is easier to find them a meaningful role and space within the school environment. Tutors also play a part in school development; by observing the key challenges related to digital skills in classrooms, they can provide valuable insights to the school leadership.

Obstacles and Enablers

Researchers from the Universities of Tampere, Helsinki and Turku addressed a set of questions on digitalisation in schools in the 2020s using a range of extensive quantitative samples as well as in-depth qualitative data. The research findings are summarised into recommendations that can inform decisions about the use of future technologies during lessons. Teachers are key agents in the digitalisation of schools. Without their active and engaging use of technology, school digitalisation remains incomplete, and students' digital competence will not develop equitably. Research found both barriers and enablers of the use of digital tools.

Barriers to the pedagogical use of digital tools

- Students use digital tools at school mostly at a basic level. Advanced use (e.g. programming, automation) is virtually non-existent in schools.
- Lack of digital pedagogy. Digitalisation in schools has largely remained at the level of "digitisation"—converting analogue materials into digital form without pedagogical transformation.
- Teacher attitudes and experience. Teachers with longer careers use digital tools more frequently, but advanced use is hindered by uncertainty and feeling uncertain about the benefits of technology. Male teachers use technology more than female teachers.
- Digital self-efficacy (confidence in using technology). According to research, low digital self-efficacy limits both basic and advanced use of digital tools.
- Subject-specific differences. Foreign language teachers use digital technology the least. Math teachers use it more.
- Teachers’ perceptions of digital resources. Feeling that resources are insufficient can hinder use, even when resources are in fact available.
- External policy guidance exists but is ineffective. Guidance from municipalities and authorities has not yet achieved the intended impact on everyday teaching.

Enablers for the pedagogical use of digital tools

- High digital self-efficacy. The more confident teachers feel about their digital skills, the more likely they are to use technology in teaching.
- Positive experience with digital resources. A favourable view of the quantity, quality, and reliability of devices increases basic use.
- Belief in technology’s benefits for learning. Believing that technology supports learning promotes the basic use of digital tools in schools (though it does not predict advanced use).

- Teaching experience of 5–25 years. Teachers in this group use digital tools for basic purposes the most.
- In-service training and the pedagogical technology acceptance model. Kyllönen's (2020) model emphasises supporting teachers through training and strengthening their self-efficacy.
- Targeted training measures. Continuing education aimed especially at teachers who use less digital technology is crucial. Making this education compulsory will increase the effect. Also, including a digital technology course in the basic curriculum can increase its use in schools.

Sources and practices

- Tekoäly varhaiskasvatuksessa ja koulutuksessa – lainsäädäntö ja suositukset
- Vapaan sivistystyön digitalisaation tavoitetila
- Varhaiskasvatuksen, esi- ja perusopetuksen sekä vapaan sivistystyön digitalisaation viitekehys
- Policies for the digitalisation of education and training until 2027
- Education Policy Report of the Finnish Government
- Government report: Digital Compass
- Digital service package for continuous learning
- Vapaan sivistystyön osaamismerkit
- National Literacy Strategy 2030
- The National Literacy Program promotes literacy and multiliteracy in Finland
- Vapaan sivistystyön lukutaitokoulutuksen opetussuunnitelmasuositus 2017
- Evaluation of literacy training for immigrants 2022
- Tausta-aineisto: Tekoälyn mahdollisuuksia opetuksen ja opiskelun tukena | Opetushallitus
- Utelias 2.0
- PerusSetti
- Game On Level Up!
- FCLab.fi
- Kaikkien-malli
- Generation AI
- Activity on Grass-roots Level – Innokas
- Kuntaliitto: Opettajatutorit tukevat koulujen digityötä
- Digitalisaatio oppimisen ja oppimistulosten selittäjänä

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Interview findings and perspectives from stakeholders

Emerging technologies integration in adult learning

In Finland, Task 2.1 involved interviews with three stakeholders representing different facets of adult education: a national-level policymaker (P1), a freelance educator and higher education lecturer (P2), and a vocational education teacher specialising in adult literacy and digital skills (P3). Together, these perspectives offered insight into how Finland's educational ecosystem integrates emerging technologies (ET) into adult learning, with attention to policy frameworks, pedagogical practices, and systemic barriers.

All participants were highly familiar with emerging technologies, particularly artificial intelligence (AI), gamification, and adaptive learning tools. Participant 1 had direct involvement in shaping Finland's national AI education guidelines and contributed to the development of support packages for educators. Participants 2 and 3 were experienced practitioners, applying digital tools in daily instruction and training teachers in their use. Notably, P2 had also integrated virtual and augmented reality (VR/AR) into educator training, while P3 focused on AI-supported literacy tools in multilingual classrooms.

As P1 explained, her work "focuses on staying up to date with new technologies, how they are implemented, and the legal, pedagogical, and quality-related questions they raise [as well as] how all of this connects to the curricula." The Finnish case thus reflects both national coordination and individual innovation in ET use.

Emerging technologies are widely employed across educational levels in Finland, although their use in non-formal adult education remains limited. Educators use AI to customise materials to varying literacy levels, enhance independent learning, and support engagement through gamification platforms such as Wordwall. P3 reported using AI tools to provide equitable and objective feedback, observing that "students often accept the automated feedback more humbly than traditional feedback… [because] they perceive it as objective."

In vocational education, adaptive platforms help identify learner needs in real time. AI-powered learning analytics and virtual learning assistants, though not yet widely adopted, are emerging as promising innovations for individualising learning and freeing up educators' time.

AR/VR technologies, while no longer novel, are still seen as effective when pedagogically integrated. P2 described their value in helping educators visualise content creation and interaction: "360 images, augmented reality, and virtual reality aren't exactly new anymore… but they still provide immersive learning opportunities."

A standout success at the policy level is Finland's national AI guidelines for education, which provide structured guidance across education levels and promote responsible, legally compliant AI adoption. These guidelines address EU and national legal frameworks, pedagogical integration, and practical recommendations for safe AI use.

At the classroom level, several best practices emerged:

- Gamification and AI integration to increase motivation and personalise feedback.
- Use of Wordwall and similar platforms for rapid, multilingual literacy material creation.
- Simplification through tool minimalism, as P3 put it, “Use fewer tools. Choose one and stick to it.”
- Teacher autonomy and trust, supported by strong pedagogical foundations and student feedback.

These successes were supported by institutional factors such as school-level leadership, access to digital tutors, and Finland’s open educational resource libraries. As P1 noted, “Teachers should trust their own pedagogical expertise, which serves as the foundation.”

Despite Finland’s high digital readiness, several structural, financial, and cultural barriers limit the effective integration of ET in adult learning. Technical barriers include a shortage of IT support staff, limitations in software licensing, and fragmented device management systems. Institutional inconsistency in tool approval and data protection interpretation means that educators in different institutions face widely varying constraints. P2 highlighted the inefficiency of this approach: “It’s a huge waste of resources that each institution conducts these evaluations separately.” Financial constraints affect both tool availability and training. App costs are rising, and support staff hours are often reduced due to budget cuts.

Lack of time and training opportunities was consistently emphasised. Teachers receive few training sessions per year, often scheduled without flexibility, limiting their ability to experiment or reflect. Legal and bureaucratic complexity, especially around terms of service and compliance, creates a chilling effect on experimentation. Negative media discourse and cultural resistance further complicate adoption. Some institutions even ban the use of AI tools, reflecting fear or misunderstanding rather than pedagogical reasoning. As P3 observed, “New technologies are not utilised enough throughout the education sector. This is mainly because of the skill level of teachers and the lack of resources given for teachers to get more training.”

Finland’s experience reveals that the technical feasibility of integrating ET is well established, but its educational impact hinges on systemic coordination, leadership engagement, and professional support. The national AI guidelines represent a strong foundation, but their effectiveness depends on consistent institutional adoption and sufficient infrastructure for implementation.

Participants called for:

- Dedicated digital pedagogical support staff, ideally active teachers who can offer peer-to-peer mentoring.
- Curriculum updates and leadership training, to ensure decision-makers remain connected to classroom realities.

- Clear national-level coordination on tool approval and data security, reducing institutional inefficiencies.
- Flexible training formats, including short, practical sessions and long-term professional development tracks.

In the words of P1: “We have a mandatory national curriculum at all levels, and that’s the instrument we use to define what schools are supposed to do.” Leveraging this existing structure, while enhancing its responsiveness to emerging technologies, could ensure that Finland continues to lead in responsible and inclusive digital education.

Holistic literacy programmes and emerging technologies

The Finnish field research for Task 2.2 offers a multi-layered view of how holistic literacy programmes can be supported through emerging technologies in adult learning settings.. Drawing from interviews with social inclusion experts, an adult educator working in non-formal education, and an adult learner from a vulnerable background, the findings reveal both the promise and the fragility of digital inclusion strategies in practice. The integration of digital tools into adult literacy programs is increasingly shaped not only by technological availability but by the interwoven challenges of access, confidence, prior learning experiences, and social complexity.

Social inclusion experts emphasised that the role of emerging technologies has expanded rapidly with the rise of AI. Traditional assistive tools like reading rulers and overlays remain in use, but newer AI-powered applications are now beginning to bridge deeper gaps in literacy and accessibility. Tools that convert speech into text, extract text from images, or offer real-time translation are helping adult learners with limited language skills, learning difficulties, or sensory impairments to engage more equitably with educational materials. The transition from niche accessibility tools to widely normalised applications has been viewed as a positive development. As one expert explained, “Digital tools play a massive role these days - they improve accessibility and bring more equality for different types of learners.”

Despite this growing potential, the use of emerging technologies in holistic literacy programs is still inconsistent, particularly in non-formal adult education. The adult educator interviewed pointed out that basic digital tools are fairly common, but advanced tools such as AI-based support systems are not yet fully integrated. Their adoption often depends on the initiative and digital competence of individual educators, rather than a systematic framework. This leads to uneven learner experiences and misses opportunities for building foundational skills through engaging, multimodal platforms.

The challenges faced by adult learners from vulnerable groups in Finland remain substantial. Many learners carry negative educational histories, with some believing they are simply incapable of further study due to past failures or unrecognised learning difficulties. Immigrant learners often face additional barriers, such as unfamiliarity with the local service infrastructure, digital interfaces, or cultural expectations around self-directed learning and disclosure of need. These factors frequently intersect in ways that make educational participation seem inaccessible or irrelevant, especially when systems are not designed to accommodate diverse experiences.

Digital skills are increasingly essential for everyday life in Finland - from accessing public services to submitting job applications. Yet, for many adults, simply applying for a course is an overwhelming task.

The learner who participated in the study confirmed the importance of basic digital training, having personally benefited from structured courses that introduced them to essential tools. Their experience underscores the role of non-formal adult education institutions as crucial contact points for digital inclusion. However, as the educator noted, these institutions often operate without sufficient support structures, and there is no standardised method for identifying or responding to learner needs in this context.

Despite these barriers, there are promising examples of how technology is used to overcome exclusion. Tools like Microsoft Lens and immersive reading software have proven effective in enhancing access to text for learners with visual impairments or limited literacy. Virtual learning environments can simulate real-life contexts in which learners can engage without relying heavily on reading or writing, supporting both autonomy and relevance. Additionally, digital platforms can offer learning in formats that suit diverse preferences—whether through listening, watching, or reading. These multimodal approaches are particularly well-suited to learners who lack formal educational experience and may struggle with conventional instruction.

The findings also point to systemic gaps that delay sustained progress. There is a clear lack of institutional coordination around learning support in adult education, especially in non-formal contexts. Teachers and social workers operate with limited resources and fragmented mandates, making it difficult to provide long-term, individualised support. Participants highlighted the need for policies that recognise the cumulative nature of digital and cultural integration. One-off interventions or project-based initiatives are insufficient for learners who may need years to acquire the skills required for meaningful participation.

Educators working with adults from vulnerable groups face their own set of challenges. Many are unfamiliar with emerging technologies, lack access to adequate training, and feel uncertain about the pedagogical value of new tools. Even when training is available, it is often too brief, too theoretical, or ill-matched to the practical realities of diverse classrooms. Participants stressed the importance of professional development that is hands-on, reflective, and sensitive to different learning styles among educators themselves. Peer support networks, mentoring, and consistent institutional investment were identified as necessary conditions for improving educator readiness and confidence. As one participant put it, “Educators are also diverse learners, just like their students.”

The ethical and cultural dimensions of technology use also emerged as critical. Some educators still perceive tools like voice dictation or AI-supported proofreading as less legitimate than traditional methods. This mindset can create unclear expectations and, at times, ableist practices that exclude or disadvantage learners who rely on digital tools for support. In contrast, participants advocated for a values-based approach, seeing technology not as a shortcut but as a form of scaffolding that enables all learners to express themselves and succeed on their terms.

Overall, the Finnish experience demonstrates that while emerging technologies can greatly enhance holistic literacy efforts, their success depends on more than digital infrastructure or tool availability. Sustainable impact requires a pedagogical culture rooted in empathy, practical support systems tailored to adult learners' needs, and policy frameworks that prioritise long-term investment over short-term innovation. When designed and delivered with intentionality, digital tools can foster not only literacy but also self-efficacy, agency, and inclusion, precisely the outcomes most needed by those at the margins of education.

Learner Voice: Finland

This interview with a woman in her early 40s, originally from Afghanistan and living in Finland for seven years, offers a powerful insight into the ways emerging technologies intersect with migration, caregiving, and digital inclusion. A mother of four and a Farsi speaker with limited Finnish proficiency, her experience illustrates the complex interplay of motivation, digital access, and systemic obstacles in the lives of many vulnerable adult learners.

Her primary digital environment is her smartphone, which she uses daily for communication, information-seeking, and essential tasks such as online banking and social media. She reports using tools like WhatsApp, Facebook, Google, and ChatGPT with relative ease, and finds Google Lens particularly helpful for translating Finnish content in real time—something she relied on even during the interview. Larger devices like computers or tablets remain uncomfortable for her, though she has used them occasionally in libraries and classroom settings.

Despite her active use of digital tools, she notes that she has not yet engaged with them for structured personal development—with the partial exception of searching information via ChatGPT. Her motivation to learn more is grounded in necessity: “Because everything in this life is digital,” she said. From supporting her child’s education to applying for unemployment benefits and managing healthcare, digital proficiency has become an unavoidable part of her daily life. Yet, the barriers she encounters are substantial. Navigating public services online, especially medical systems and school communication platforms like Wilma, is particularly difficult. “For example, at the doctor’s office, I don’t know how to open things, and I read afterwards what happened,” she explained. These gaps in access and understanding have real-life consequences. On multiple occasions, she missed deadlines for unemployment benefits due to difficulty using digital platforms—leaving her without income for weeks.

Her main source of support is her 14-year-old son, who acts as a digital mediator. “He helps me, especially with things like Wilma (the school platform). I trust him. He’s truly the best boy,” she said. However, she also acknowledges the emotional burden these places on both of them: “I don’t want to disturb my son… he has his own schedule and goes to sleep, so I can’t always ask him to help.” Other support options, such as employment counsellors or digital support at educational institutions, are often geographically inaccessible or not available at convenient times.

She has participated in a classroom-based digital skills course at an adult education institution, which she described as transformative, especially in terms of learning how to apply for jobs. “It’s really important how we fill out the application. This has always been very important to me. I had problems before, but now, luckily, I know how to do it.”

The success of the course, she noted, was due in large part to the teacher's approach: slow, clear, and patient. By contrast, she finds many courses too fast-paced and difficult to follow due to language barriers and the speed of instruction. When asked how digital skills training could be made more relevant, her response was clear: it should focus on practical, everyday challenges: booking medical appointments, understanding health information, and communicating with schools. These are the domains where digital exclusion becomes a source of stress and disempowerment.

This case underscores how motivation alone is not enough to guarantee digital inclusion. While this learner shows resilience, adaptability, and initiative, she continues to face significant structural and linguistic barriers that inhibit her full participation in society. Emerging technologies hold promise, but without accessible, multilingual platforms and sustained, person-centred support, they risk reinforcing exclusion rather than alleviating it.

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