

ISO/IEC JTC 1 "Information technology"

Secretariat: ANSI

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Revised JTC 1/SC 36 Business Plan

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Description

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ISO/IEC JTC 1/SC 36 "Information technology for learning, education and training"

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Updated SC36 Business Plan (2022-2023)

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Description

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STRATEGIC BUSINESS PLAN ISO/IEC JTC 1/SC 36

Information Technology for Learning, Education and Training

1 EXECUTIVE SUMMARY

ISO/IEC JTC 1/SC 36 develops international standards for information technologies (IT) used in Learning, Education and Training (LET). A key goal of SC36 standards is to provide for interoperability among different and distributed IT systems, tools and services used in LET contexts.

Digital technology impacts profoundly all aspects of LET, due largely to its growing ubiquity and constant innovation associated with it. While there is a close relationship between innovation and standardization, innovation takes place at many frontiers and is informed by practice and market needs. Maximizing the potential of such an environment requires that standards development is therefore agile and relevant.

SC36 operates within the constraint that predicting future innovations and market requirements is impossible; however, through monitoring key trends anticipating IT requirements is more realistic. Standardization work is never complete and can only ever represent documented consensus at a particular moment in time. Standardization relevant to ongoing development of a global IT infrastructure that supports and stimulates LET is therefore the key focus of SC36.

With the implementation and integration of information technologies, learning, education and training, we are experiencing a renaissance that has the potential not only to enhance human development to new levels but also to reach more individuals than ever before. Through innovations in eLearning, communities of learners have firsthand opportunities to interact and share their knowledge, skills, and insights with each other.

With over one trillion Euros per annum spent worldwide in the learning, education and training industry, educational institutions, companies, professional organizations, government ministries, and other stakeholders require information technologies that work well together and support and engage learners. Learning, education and training in the workplace and other forms of learning require information technologies that support multiple stakeholders in a manner that is both flexible and effective.

From curriculum development to delivery and assessment, educators, employers, governments, and other stakeholders need to consider privacy, adaptability and accessibility requirements. The ISO/IEC JTC1 SC36 sub-committee develops standards in these and many other areas.

2 INTRODUCTION

Through this document, SC36 aims to be responsive to a changing business environment and to review and align its work program accordingly. In maintaining its relevance and value to its stakeholders SC36 updates its business plan on a two-yearly basis. Previous versions are available at SC36N4411.



2.1 SC36 Origins and Business Planning Cycle

ISO/IEC JTC 1/SC36 (hereafter "SC36") was established by JTC1 in 1999 to serve as a peak international forum for standards development in Information Technology for Learning, Education, and Training (ITLET). In fulfilling this, SC36 serves both its constituent members, national standards bodies, as well as key liaison organizations internal and external to ISO.

As expressed by ISO, the foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade. For SC36, this means contributing to the development of an IT infrastructure that is robust, interoperable, and relevant to the needs of stakeholders within Learning, Education, and Training (LET). It also means that SC36 needs to work cooperatively with several key IT specifications organizations in a complex business environment.

2.2 Scope of SC36

“Standardization in the field of information technologies for learning, education, and training to support individuals, groups, and organizations, and to enable interoperability and reusability of resources and tools.

Excluded from this scope are:

- standards or technical reports that define educational standards (competencies), cultural conventions, learning objectives, or specific learning content.
- work done by other ISO or IEC TCs, SCs, or WGs with respect to their component, specialty, or domain. Instead, when appropriate, normative or informative references to other standards shall be included. Examples include documents on special topics such as multimedia, web content, cultural adaptation, and security.”

2.3 Strategies

Standards are developed to meet national bodies' requirements and stakeholders' needs and concerns. The drafting of standards is a collaborative effort of experts from national member bodies that is led by an individual editor or a team of editors chosen among those national experts who attend the plenary and interim meetings.

2.4 Study groups

In addition to drafting standards, SC36 activities involve study groups on specific topics. Study reports describe best practices and provide guidance. Use case collections are used to ascertain the need, scope and specifications for new standards in the field of information technology for learning, education and training.

2.5 Structure of SC36

Reference	Convenor	Title	Terms of Reference
SC36/WG3	Bernard Blandin(FR)	Learner information	Standardization with respect to information about roles and organizational positions held by participants within an ITLET system and personal information about participants using an ITLET system
SC36/WG4	Yong-Sang CHO(KR) Yuntao YU(CN, vice)	Management and delivery	IT-related standardization for the management and delivery of learning, education and training and supporting technologies
SC36/WG7	Pierre-Julien Guay(CA)	ITLET - Culture, language and individual needs	The development of standards that ensure that relevant features and processes of ITLET are adaptable to the requirements of individual users, including the requirements of users with disabilities
SC36/WG8	Yong-Sang CHO(KR)	Learning Analytics Interoperability	Standardization about data and process in relation to the conduct of analytics for technical, semantic, and organizational interoperability in ITLET domain.
SC36/WG9	Jing Du(CN)	Online course information model	Standardization on interoperability requirements in the process of organization, construction, development, utilization and implementation of online courses.
SC36/AG1	Sung-Wook SHIN(KR)	Business planning and communications	Assist the SC36 Chair and Secretariat in the review and update of the SC36 Business Plan and support SC36 in the creation and elaboration of business, communication, and marketing strategies, directions, and plans.
SC36/AG2	Jon Mason(AU)	Emerging Technologies (AGET)	Identifying Emerging Technologies that will have a likely impact on ITLET, and Providing advice to SC36 on Emerging Technologies that need to be considered in developing New Work Items



Reference	Convenor	Title	Terms of Reference
SC36/AHG5	Frederic Andres (JP)	Blockchain in Education	To explore the work of other ISO committees on blockchain and ledger technologies
SC36/AHG6	Jerry Leeson (AU, acting)	Artificial Intelligence for Education	To identify perspectives in the usage of AI in LET as well as incubation of one or more candidate projects to be provided to WGs of SC36
SC36/TCG	Mokhtar Ben Henda (FR)	Terminology Coordination Group	To ensure that the vocabulary of all of SC36 WGs and AGs is monitored and managed during all stages of their development including reviewing terms and definitions in already published standards.

* WG: Working Group, AG: Advisory Group, AHG: Ad-hoc Group

Joint working group under the responsibility of another committee

Reference	Convenor	Title	Terms of Reference
JTC1/SC24/JWG12	Erlend Øverby (NO)	Joint ISO/IEC JTC1/SC 24 - ISO/IEC JTC1/SC 36 WG : VR/AR/MR based ICT Integration Systems standards	Analyze and develop use cases to support requirements for work items in the area of VR/AR/MR based ICT integration systems, and develop standards related to VR/AR/MR based ICT integration systems.

3 BUSINESS ENVIRONMENT

3.1 Context

The context for the use of information technology in learning, education and training has changed significantly over the last few years. Global requirements include accessibility and privacy, shared vocabulary, and collaboration. For example, accessibility requirements are legislated in many countries and must be supported by new tools.

With the advent of cloud computing, content (including private and management data) can be hosted anywhere, out of the reach of local legislations. With the proliferation of big data and unregulated data mining, however, surveillance of citizens (such as teachers and learners) that may contravene national and international privacy rights and legislation. Thus, privacy of stakeholders within the education sector may be at risk when redundancy and backup systems are hosted in countries other than where the learner lives.

While UNESCO promotes the use of open educational resources (OER), policies meant to frame and respect instructors' and learners' contributions are still lacking. In addition, provisions are needed so that procurement procedures reflect the requirements of learners, instructors, and others (e.g., accessibility, open-source and

proprietary software that are interoperable, privacy protection, etc.). In addition, while Governments are becoming providers of big data and open data, data mining tools and expertise remain lacking, stressing the need for increased digital literacy.

Quality assurance methodologies are essential in contemporary educational contexts. Quality processes are typically implemented to ensure the efficacy of systems and the optimization of stakeholder experience.

3.2 Key Trends

In this environment several important trends are giving shape to technological innovation as well as stakeholder expectations. These include:

- The “open” agenda, building upon the success of Open Source Software and now driven largely by the movement for Open Educational Resources (OER), large scale free online courses in the form of Massive Online Open Courses (MOOCs)
- Emerging Open Educational Practices (OEP), such as open assessment and open peer review.
- Assessment and Teaching of 21st Century Skills – marking a shift from content-centric pedagogies.
- The mobile revolution and the shift from desktop, or tethered, computing and the WIMP (Windows Icon Mouse Pointer) environment to a more flexible, mobile, and personal NUI (Natural User Interface).
- A growing tension within educational institutions in terms of provision of a standardized operating environment (SOE) and the individual user making use of their own equipment -- described as bring your own device (BYOD).
- Embedding of social media in many facets of daily life, including professional, workplace, and learning contexts.
- The rise of the data-driven enterprise and data-driven classroom through supported by Learning Analytics and Educational Data Mining.
- Strong market acceptance of “cloud-based” software as a service (SAAS), signaling a major shift from locally installed software solutions.
- Game-based learning is growing due to the enormous and growing market for digital games.
- Consolidation of the Learning Management System (LMS) as the core learning platform within higher education while at the same time a questioning of this role due to the growth in the provision of free and niche services on the open web.
- Emergence of Artificial Intelligence (AI) as a major driver of innovation in digital technology, extending the scope of entities within the digital environment – e.g., neither the ‘learner’ nor the ‘instructor’ is necessarily human any more.
- Emergence of the Internet of Things (IoT) and installation of ‘smart’ environments – interconnecting an increasing array of devices and sensors that can share data and interact with systems and stakeholders.
- Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory. AR can be defined as a system that incorporates three basic features: a combination of real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and real objects.
- Virtual reality (VR) is a simulated experience that can be similar to or completely different from the real world. Applications of virtual reality include entertainment (e.g. video games), education (e.g. medical or military training) and business (e.g. virtual meetings).
- Mixed reality (MR) is the merging of real and virtual worlds to produce new environments and visualizations, where physical and digital objects co-exist and interact in real time.
- Metaverse is typically used to describe the concept of a future iteration of the internet, made up of

persistent, shared, 3D virtual spaces linked into a perceived virtual universe. The metaverse in a broader sense may not only refer to virtual worlds, but Internet as a whole, including the entire spectrum of augmented reality.

- Digital Humans are AI powered human-like virtual beings that offer the best of both: AI and Human conversation. Also, they can easily connect to any digital brain to share knowledge (i.e. chatbot and NLP (Neuro-Linguistic Programming))
- A digital twin is a virtual representation that serves as the real-time digital counterpart of a physical object or process. Digital twins are the result of continual improvement in the creation of product design and engineering activities.
- Blockchain is described as a "trustless and fully decentralized peer-to-peer immutable data storage" that is spread over a network of participants often referred to as nodes. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data.

In addition, there are numerous innovative companies developing technology that drives the change in how technology can facilitate and support learning. Often, a new 'startup' company becomes successful very quickly in offering an innovation that can sometimes function as a 'disruptor' to conventional practice. There has been rapid growth of new startups and research groups working on EdTech in the last years. For the EdTech industry to have a global impact, there is a need for standards that ensure interoperability among all the apps and tools being developed.¹

3.3 Opportunities with a large stakeholder base

The following describes the business environment of the LET sector and its products, services, and practices. They influence how the relevant standards development processes are conducted and the content of the resulting standards.

The formal education and training sector worldwide consist of an extremely broad base of stakeholder organizations, jurisdictions, regulatory frameworks, and practices. It is also subject to political and economic conditions and the forces of globalization. Workplace requirements for lifelong learning and a growing global market for education and training products and services add to this complexity while also providing opportunities for innovation and growth.

Stakeholders range from small businesses providing a single service to huge organizations that perform continuous training of their professionals, such as the airline industry and the military complex. Our stakeholders within formal education contexts range from small private schools to large public universities – commercial schools to ministries of education, covering learners in all stages of their life from kindergarten, school, universities, to lifelong education requiring development of new skills for an active retirement, for all people from all cultures and regions. The standards developed by SC36 must meet the expectations of this large stakeholder base. This provides some challenges and opportunities for the standards we develop.

Our standards have been developed as foundational, and in their nature must be adapted to different use scenarios and use cases. Our standards provide some foundational principles that ensures a minimal level of interoperability that facilitate a graceful degradation of interoperability by design.

Standards developed by SC36 should therefore be used as a base and starting point for development of

¹ <http://tech.ed.gov> , <http://edtecheurope.com>, <http://www.edtechsummitafrica.com>, <http://www.edtechasia.com/>



standards for use by all stakeholders in their local context.

However, with this base of stakeholders we in SC36 expects new work item proposal that should address base functionality in the digital learning ecosystems that supports innovation and new services supporting the key “business” of our stakeholders.

ITLET is a domain of constant change. Therefore, a core focus of SC36 – digital learning – is now taking place in an increasing diversity of contexts which include emergent trends as well as established practice. Not so long ago 'self-paced, single learner, customized instruction' seemed revolutionary. That was prior to the social media revolution; and, in recent years, the mobile revolution. Today, in the 'anytime, anywhere' mobile-enabled world the early years of digital learning appears to be overly managed and desktop-bound. Thus, while learning management systems and managed learning environments have become established platforms common throughout higher education and professional on-the-job training, there are many innovations such as Massive Online Open Courses (MOOCs), the proliferation of apps on handheld devices, and an increasing desire of stakeholders for Open Educational Resources (OERs) that require standards development organizations to perform a balancing act between being responsive to real market requirements while also providing leadership in positioning for future sustainability

4 Benefits of SC36

The development of knowledge and skills in education, industry, and other fields is increasingly linked to efficient use of information technology. The development of competency frameworks and associated information technology systems by educational institutions, companies, professional organizations, associations, government ministries, and others can be leveraged and shared to better support learning outcomes.

Standards that focus on metadata for educational content and context, technical requirements and rights management can help learning resource providers to more meaningfully interact and more effectively support organizations and their respective educators, trainers, and learners to tailor and enhance teaching and learning experiences using materials from different sources (e.g., OER, publisher content, etc.).

With mobility, content delivery can happen everywhere, at any time, and with a wide variety of support. Content interoperability and student tracking are critical issues for seamless integration of onsite and online activities, especially in an evolving information technology landscape where tens of thousands of learners have the opportunity to interact together in learning activities in online environments.

Benefits of adopting ISO/IEC SC36 standards on information technology for learning, education and training include:

- sustainability, through the use of investment strategies that support data migration.
- an information ecosystem that supports both open and proprietary formats and allows for content migration and sharing of information using new tools platforms, and solutions.
- interoperability, the ability to share content and data across multiple platforms.

4.1 Application areas

ITLET data can be divided into four types each requiring a specific set(s) of specifications and standards. Below are some published standards developed within the SC36 sub-committee, addressing each type. As of 2021, more than 14 other standards, currently under development, are not listed here.

- Content: learning resource description, referencing and packaging.
- ISO/IEC 12785 series– Content Packaging
- ISO/IEC 19788 series –Metadata for learning resources
- ISO/IEC 29163 series – Sharable Content Object Reference Model
- ISO/IEC TR 18120 – Requirements for e-textbooks in education
- Programs and curriculum and competencies description to help tracking learner progress.
- ISO/IEC 20006 series – Information model for competency
- Technical data related to resource delivery (DRM, streaming and downloading,) and user data (identity, preferences, accessibility)
- ISO/IEC 23988:2007 – A code of practice for the use of information technology (IT) in the delivery of assessments
- ISO/IEC 24751 series – Individualized adaptability and accessibility in e-learning, education and training
- ISO/IEC TS 29140 series – Nomadicity and mobile technologies
- ISO/IEC 20016-1:2014 – Language accessibility and human interface equivalencies (HIEs) in e-learning applications
- ISO/IEC 29187 series -- Identification of privacy protection requirements pertaining to learning, education and training (LET)
- Tracking data to collect learner output and support learning analytics
- ISO/IEC 24703:2004 – Participant Identifiers
- ISO/IEC 19778 series – Collaborative technology
- ISO/IEC 19780 series – Collaborative learning communication
- ISO/IEC 36000 series – Quality management, assurance and metrics
- ISO/IEC 20748 series – Learning analytics interoperability

4.2 Users of SC36 standards

We now train and study within learning ecologies that are complex, consisting of countless tools and services. The challenge for standardization is to support key stakeholders such as learners, instructors, and administrators within their workflows and within these broader 'ecologies', providing authentication, responding to user inputs, and collecting usage data.

ISO/IEC JTC1 SC36 standards can form the basis for development, implementation, and evaluation of information technologies used for learning, education, and training initiatives by educational institutions, companies, professional organizations, government ministries, and other stakeholders. They also can be used to support assessments of learning and evaluations of Return on Education (ROE), agreements (e.g., service level and operational level agreements (SLA/OLA)), purchasing processes, and evaluation of digital services supply chains, among other things.



Learning, education, and training directors can benefit from standards to choose sustainable, efficient and interoperable delivery tools for content and apply quality assurance to support the whole educational process, including online learning and learning analysis.

Learning, educational, and training counsellors can use competencies and portfolio reference models for recognition of acquired competencies. As well, these standards can be used to ensure guidelines and other supports are in place for individual learners and to enhance and improve conformance with accessibility legislation.

Instructors, teachers, and trainers can share educational resources and provide a rich variety of learning experiences through social networks and collaborative tools in safe, secure environments that respect the privacy of learners.

Information technology vendors, online content developers, and other professionals can be informed by and provide input into an integrated set of standards that are modular and adaptable to better meet the needs of their respective communities.

5 REPRESENTATION AND PARTICIPATION IN SC36

5.1 The following countries are participating in SC36.

5.1.1 P-Members: 21

Australia (SA), Canada (SCC), China (SAC), Finland (SFS), France (AFNOR), Germany (DIN), India (BIS), Italy (UNI), Japan (JISC), Kazakhstan (KAZMEST), Republic of Korea (KATS), Netherlands (NEN), Norway (SN), Philippines (BPS), Portugal (IPQ), Russian Federation (GOST R), Slovakia (SOSMT), South Africa (SABS), Spain (AENOR), Ukraine (DSTU), United Kingdom (BSI)

5.1.2 O-Members: 26

Algeria (IANOR), Argentina (IRAM), Austria (ASI), Belgium (NBN), Bosnia and Herzegovina (BAS), Colombia (ICONTEC), Czech Republic (UNMZ), Ethiopia (ESA), Ghana (GSA), Greece (NQIS ELOT), Ethiopia (ESA), Hong Kong (ITCHKSAR), Hungary (MSZT), Indonesia (BSN), Islamic Republic of Iran (ISIRI), Ireland (NSAI), Kenya (KEBS), New Zealand (SNZ), Pakistan (PSQCA), Romania (ASRO), Saudi Arabia (SASO), Serbia (ISS), Sweden (SIS), Switzerland (SNV), Tunisia (INNORPI), Turkey (TSE), Uganda (UNBS)

5.2 Analysis of the participation

The participation and activity in SC36 have represented a high level of engagement since inception, with many new projects established and new projects in the preparation. However, most active partners are from industrialized countries, with well-established educational systems and institutions.

Learning Technology (ITLET) is seen by many as a means for spreading and engaging education in less developed regions and countries. The use of learning technology bears the promise of providing education at a less cost, and maybe more efficient to areas where education institutions and systems are not so well established, or in regions where educational systems and institutions are being established.

To develop standards that meet a variety of use scenarios and to ensure that the standards we develop meet



the needs and requirements for countries that are in the process of establishing and developing their educational systems we would appreciate greater involvement from stakeholders and educational industry from countries in these processes.

In SC36, we are encouraging current active P-Members to reach out to such countries and try to establish twinning and other liaison arrangements to get more involvement and contributions from these countries.

Many universities have departments that do research on the development and impact of learning technologies. In SC36 we would also like to see more involvement and engagement from these research institutes, so that results from relevant research could be developed as IT standards for better dissemination of the research results, but also to have new standards established that better meet current and future requirements.

6 Liaison of SC36

6.1 Liaison committees to ISO/IEC JTC 1/SC 36

Reference	Title	ISO/IEC
ISO/IEC JTC 1/SC 24	Computer graphics, image processing and environmental data representation	ISO/IEC
ISO/IEC JTC 1/SC 27	Information security, cybersecurity and privacy protection	ISO/IEC
ISO/IEC JTC 1/SC 34	Document description and processing languages	ISO/IEC
ISO/IEC JTC 1/SC 35	User interfaces	ISO/IEC
ISO/IEC JTC 1/SC 42	Artificial intelligence	ISO/IEC
ISO/TC 176	Quality management and quality assurance	ISO
ISO/TC 211	Geographic information/Geomatics	ISO
ISO/TC 232	Education and learning services	ISO
ISO/TC 37/SC 2	Terminology workflow and language coding	ISO

6.2 Liaison committees from ISO/IEC JTC 1/SC 36

Reference	Title	ISO/IEC
ISO/IEC JTC 1	Information technology	ISO/IEC
ISO/IEC JTC 1/SC 24	Computer graphics, image processing and environmental data representation	ISO/IEC
ISO/IEC JTC 1/SC 32	Data management and interchange	ISO/IEC
ISO/IEC JTC 1/SC 34	Document description and processing languages	ISO/IEC
ISO/IEC JTC 1/SC 41	Internet of things and digital twin	ISO/IEC
ISO/IEC JTC 1/SC 42	Artificial intelligence	ISO/IEC
ISO/TC 37	Language and terminology	ISO
ISO/TC 46	Information and documentation	ISO
ISO/TC 215	Health informatics	ISO
ISO/TC 232	Education and learning services	ISO
ISO/TC 260	Human resource management	ISO

6.3 ORGANIZATIONS IN LIAISON (CATEGORY A AND B)

Reference	Title	ISO/IEC
AUF	Agence Universitaire de la Francophonie	A
Infoterm	International Information Centre for Terminology (Infoterm)	A
LTSC	IEEE Learning Technology Standards Committee	A



7 STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

This section gives an overview of the ISO/IECJTC1 SC36's structure, scope, projects and publications. All of this information is updated regularly and is available on ISO's website, ISO Online (Click on the links below to find the following information).

- [About \(Secretariat, Secretary, Chair, Date of creation, Scope, etc.\)](#)
- [Contact details](#)
- [Structure \(Subcommittees and working groups\)](#)
- [Liaisons](#)
- [Meetings](#)
- [Tools](#)
- [Work programme \(published standards and standards under development\)](#)

<Annex>

SC36 contribution to UN SDGs

The list of SC36 projects and publications that support and are consistent with the UN Sustainable Development Goals

Reference No.	Document title	WG	SDGs
ISO/IEC CD 29187-1	Information technology — Identification of privacy protection requirements pertaining to learning, education and training (LET) — Part 1: Framework and reference model	WG 3	4,9,10,16
ISO/IEC 29140:2021	Information technology for learning, education and training — Nomadicity and mobile technologies	WG 3	4,8,9,10
ISO/IEC 23127-1:2021	Information technology — Learning, education, and training — Metadata for facilitators of online learning — Part 1: Framework	WG 3	4, 9, 10
ISO/IEC 22602:2019	Information technology — Learning, education and training — Competency models expressed in MLR	WG 3	4,8,9
ISO/IEC 20013:2020	Information technology for learning, education and training — Reference framework of e-Portfolio information	WG 3	4,5,8,9,10,11
ISO/IEC 19479:2019	Information technology for learning, education, and training — Learner mobility achievement information (LMAI)	WG 3	4,5,8,9
ISO/IEC TR 24763:2011	Information technology — Learning, education and training — Conceptual Reference Model for Competency Information and Related Objects	WG 3	4,8,9



Reference No.	Document title	WG	SDGs
ISO/IEC 24703:2004	Information technology — Participant Identifiers	WG 3	4,9,11
ISO/IEC 20006-1:2014	Information technology for learning, education and training — Information model for competency — Part 1: Competency general framework and information model	WG 3	4,8,9
ISO/IEC 20006-2:2015	Information technology for learning, education and training — Information model for competency — Part 2: Proficiency level information model	WG 3	4,8,9
ISO/IEC CD 4932	Information technology — Learning, education and training — Access For All Metadata: Accessibility Core Terms (AfA-core-terms)	WG 4	4, 10
ISO/IEC CD 19788-1	Information technology — Learning, education and training — Metadata for learning resources — Part 1: Framework	WG 4	4
ISO/IEC DTR 23844	Information technology for learning, education, and training — Immersive content and technology in LET domain	WG 4	4
ISO/IEC 23126:2021	Information technology for learning, education and training — Ubiquitous learning resource organization and description framework	WG 4	4
ISO/IEC 19788-7:2019	Information technology — Learning, education and training — Metadata for learning resources — Part 7: Bindings	WG 4	4
ISO/IEC TR	Information technology — Learning, education and training — Metadata for learning resources — Part	WG 4	4

Reference No.	Document title	WG	SDGs
19788-11:2017	11: Migration from LOM to MLR		
ISO/IEC TR 23843:2020	Information technology for learning, education and training — Catalogue model for virtual, augmented and mixed reality content	WG 4	4
ISO/IEC TR 12785-3:2012	Information technology — Learning, education, and training — Content packaging — Part 3: Best practice and implementation guide	WG 4	4
ISO/IEC 12785-1:2009	Information technology — Learning, education, and training — Content packaging — Part 1: Information model	WG 4	4
ISO/IEC 12785-2:2011	Information technology — Learning, education, and training — Content packaging — Part 2: XML binding	WG 4	4
ISO/IEC 19788-2:2011	Information technology — Learning, education and training — Metadata for learning resources — Part 2: Dublin Core elements	WG 4	4
ISO/IEC 19788-3:2011	Information technology — Learning, education and training — Metadata for learning resources — Part 3: Basic application profile	WG 4	4
ISO/IEC 19788-4:2014	Information technology — Learning, education and training — Metadata for learning resources — Part 4: Technical elements	WG 4	4
ISO/IEC 19788-5:2012	Information technology — Learning, education and training — Metadata for learning resources — Part 5: Educational elements	WG 4	4

Reference No.	Document title	WG	SDGs
ISO/IEC 19788-8:2015	Information technology — Learning, education and training — Metadata for learning resources — Part 8: Data elements for MLR records	WG 4	4
ISO/IEC 19788-9:2015	Information technology — Learning, education and training — Metadata for learning resources — Part 9: Data elements for persons	WG 4	4
ISO/IEC CD 20016-1	Information technology for learning, education and training — Language accessibility and human interface equivalencies (HIEs) in e-learning applications — Part 1: Framework and reference model for semantic interoperability	WG 7	4,8,9,10,16
ISO/IEC DIS 24751-4	Information technology for learning, education and training — AccessForAll framework for individualized accessibility — Part 4: Registry server API	WG 7	4,10
ISO/IEC TR 23842-1:2020	Information technology for learning, education and training — Human factor guidelines for virtual reality content — Part 1: Considerations when using VR content	WG 7	4
ISO/IEC TR 23842-2:2020	Information technology for learning, education, and training — Human factor guidelines for virtual reality content — Part 2: Considerations when making VR content	WG 7	4
ISO/IEC 24751-1:2008	Information technology — Individualized adaptability and accessibility in e-learning, education and training — Part 1: Framework and reference model	WG 7	4,10



Reference No.	Document title	WG	SDGs
ISO/IEC 24751-2:2008	Information technology — Individualized adaptability and accessibility in e-learning, education and training — Part 2: "Access for all" personal needs and preferences for digital delivery	WG 7	4,10
ISO/IEC AWI TR 9858	Use Cases on Advanced Learning Analytics Services using Emerging Technologies	WG 8	4, 9, 17
ISO/IEC TR 20748-1	Information technology for learning, education and training — Learning analytics interoperability — Part 1: Reference model	WG 8	4,9
ISO/IEC TR 20748-2	Information technology for learning, education and training — Learning analytics interoperability — Part 2: System requirements	WG 8	4,9
ISO/IEC TS 20748-3	Information technology for learning, education and training — Learning analytics interoperability — Part 3: Guidelines for data interoperability	WG 8	4,9
ISO/IEC TS 20748-4	Information technology for learning, education and training — Learning analytics interoperability — Part 4: Privacy and data protection policies	WG 8	4,9
ISO/IEC AWI 8808	Information Technology for Learning, Education and Training — Online course information model	WG 9	4