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Information Technology for Learning, Education and Training — Information Model for Competency —

Part 1: Competency General Framework and Information Model

ICS 03.100.30; 35.240.99

iTeh STANDARD PREVIEW
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80 Foreword

81 ISO (the International Organization for Standardization) and IEC (the International Electrotechnical
82 Commission) form the specialized system for worldwide standardization. National bodies that are members of
83 ISO or IEC participate in the development of International Standards through technical committees
84 established by the respective organization to deal with particular fields of technical activity. ISO and IEC
85 technical committees collaborate in fields of mutual interest. Other international organizations, governmental
86 and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information
87 technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

88 International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

89 The main task of the joint technical committee is to prepare International Standards. Draft International
90 Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as
91 an International Standard requires approval by at least 75 % of the national bodies casting a vote.

92 Attention is drawn to the possibility that some of the elements of this document may be the subject of patent
93 rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

94 ISO/IEC 20006-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Joint Technical Committee,*
95 *Subcommittee SC 36, Information Technology for Learning, Education and Training.*

96 ISO/IEC 20006 consists of the following parts, under the general title *Information Technology for Learning,*
97 *Education and Training — Information Model for Competency:*

98 — *Part 1: Competency General Framework and Information Model*

99 — *Part 2: Proficiency Level Information Model*

100 — *Part 3: Guidelines for Aggregation of Competency Information and Data*

101 Introduction

102 **[Project Co-editors Note: The new text provided below is intended to address UK and the AU**
 103 **comments that requested a simple statement that would explain how this standard will support**
 104 **development of better ITLET systems, how this work relates to existing specifications such as**
 105 **RDCEO, and to identify the interoperability challenges encountered. As an alternative the previous**
 106 **updated text has also been provided. NBs are asked to vote as to which text they prefer and to**
 107 **provide suggestions for improvement.]**

108 **New Text:**

109 Organizations, such as schools, universities, institutes, governments, and companies, use different ITLET
 110 systems to support the management and exchange of competency information. To meet their mission and
 111 goals, such organizations may rely on Human Resource Information Systems (HRISs), Learning
 112 Management Systems (LMSs), assessment systems, and other types of IT systems to communicate and
 113 store competency-related information. These IT systems are often quite diverse, employ one or more
 114 different approaches and may be standalone or integrated in combination with other IT systems. They
 115 may be

- 116 • developed in-house,
- 117 • provided through ITLET providers and suppliers,
- 118 • adapted from open source products, or
- 119 • other.

120 Due to lack of interoperability, some typical problems encountered by stakeholders as well as with ITLET
 121 systems dedicated to the management and exchange of competency information include use of

- 122 • different competency schema;
- 123 • diverse information architectures and software that is not compatible;
- 124 • dissimilar information models and approaches; and,
- 125 • other.

126 Initial observations suggest that much work remains to be done in order to

- 127 • Accommodate complicated competencies;
- 128 • Link competencies adequately;
- 129 • Support comparisons of competency information and data between different communities;
- 130 • Track and scaffold the knowledge state of the learner;
- 131 • Other.

132 If there are interoperability issues then these issues may be encountered as noted in the examples below
 133 (Hirata & Brown, 2008):

134 **Example 1: Technical** - Competency and associated information cannot always be selected and shared
 135 between different ITLET systems (e.g., learning management, HR, and other related platforms);

136 **Example 2: Organizational** - Competency and associated information is not easily used in human
 137 development activities, because skills and competency information may be detailed or expressed
 138 differently in various ITLET systems (e.g., learning management, HR, national occupational classification,
 139 and other related systems);

140 **Example 3: Information exchange** - Skills and competency proficiency information, such as individual
 141 status or degrees acquired, cannot be shared easily amongst different ITLET systems (e.g., HR, learning
 142 management, national occupational classification, and other related systems);

143 **Example 4: Individual learner** - Individual developmental learning, education, and training paths cannot
 144 easily migrate or be exchanged amongst ITLET systems;

151 **Example 5: Systems perspective** (where systems include individuals, organizations, and the
 152 technologies that support them) - Individuals and organizations cannot easily design and integrate
 153 informal and formal learning, education, and training opportunities to support life goals, career strategies,
 154 and career paths using existing common dimensions within ITLET systems;

155
 156 **Example 6: Practical analytics** - The ability to access, extract, and analyze competency and associated
 157 information can provide evidence as to whether learning, education and training information needs are
 158 being met in order to analyze lifelong learning, thus where competency information must be drawn from
 159 different systems and where non-interoperable format and definitions are used;

160
 161 **Example 7: Assessment and evaluation** - ITLET systems (e.g., acknowledgement and consideration
 162 are needed regarding evaluation biases in human assessment, the use of varying methods and metrics to
 163 evaluate human performance, and the need to conduct accurate skill gap analysis), where ITLET systems
 164 that use different competency digital schema are involved; and,

165
 166 **Example 8: Overarching goals and outcomes** - Human assessment and support for the development of
 167 human potential requires ITLET systems that provide a more flexible, holistic integration and exchange of
 168 competency and associated information beyond individual learning opportunities, everyday operation, and
 169 work performance. Competency data must be generated.
 170

171 Some of these identified problems have been addressed on a limited basis by the standards and
 172 specifications produced by the organizations mentioned above. Not only is it difficult to use these
 173 standards and specifications; however, but also the unsolved problems are still critical. It is still confusing
 174 for stakeholders to implement and use these standards and specifications. Also, various problems
 175 associated with ITLET related systems, which should be solved by or supported with information
 176 technology, still remain.

177
 178 A comparison of various competency information and data models indicates that (Sitthisak et al., 2007, IMS
 179 GLC Inc., 2002, 2010; HR-XML, 2008; Deane, 2005; Sampson, Karampiperis & Fytros, 2007 cited in
 180 Blandin, Frank, Hirata & Laughton, 2011)

- 181
- 182 1. Competency may be defined differently by various organizations, national body regulators, and others,
 183 and there may be variability in how competency is defined even within the same field.
- 184 2. Current competency information and data models seem to have limitations, and at present there does
 185 not seem to be one model that may be used for all contexts or subject domains.
- 186 3. The selective integration of existing competency information and data models may help to meet some
 187 identified limitations of the current models.

188
 189 Existing specifications, such as HR-XML, RDCEO, IEEE RCD, have been implemented in several targeted
 190 markets; however, there is growing recognition that there is no one specification that will meet the
 191 competency information needs and requirements of all organizations. Additionally, there are several
 192 examples where specification hybrids have been created in order to address the shortcomings that may
 193 exist when only one specification is used. This indicates that a critical success factor to supporting
 194 organizations that use IT systems for their competency development work is to ensure that any
 195 standardized approach is flexible and adaptable to support the diverse needs of different communities.
 196

197 Thus, the aims of the ISO/IEC 20006 series are to support the standardized exchange of competency
 198 information amongst varied IT systems that use different specifications and approaches by providing a

- 199 • General framework and information model with standardized elements, and examples of system
 200 architectures from IT systems that can support the unique approaches employed by various
 201 organizations and communities;
- 202 • Proficiency level information model that supports communication and exchange of this type of
 203 competency-related information; and,
- 204 • Guidance regarding the aggregation of competency information and data.

205 This multi-part standard may be used by software developers, implementers, instructional and test
 206 designers, and others to ensure that learning, education, and training environments reflect learners' and
 207 organizations' competency development needs.

208 **Updated Previous Text:**

209 From the late 1990s, some industrial and academic organizations have developed information technology
 210 standards in the skills and competency domain, such as human resources, on a global level to address
 211 the interoperability requirements and environmental complexities of management and sharing of
 212 competency information amongst different organizations. Some examples include work spearheaded by
 213 the following organizations: the IMS Global Learning Consortium Inc., HR-XML Consortium, IEEE-LTSC,
 214 OMG, CEN TC353 and also ISO/IEC JTC 1/SC36 itself. Some typical problems encountered by
 215 stakeholders as well as ITLET systems dedicated to the management and exchange of competency
 216 information and where these issues may be encountered are provided in examples below (Hirata & Brown,
 217 2008):

218 **Example 1: Technical** - Competency and associated information cannot always be selected and shared
 219 between different ITLET systems (e.g., learning management, HR, and other related platforms);
 220

221 **Example 2: Organizational** - Competency and associated information is not easily used in human
 222 development activities, because skills and competency information may be detailed or expressed
 223 differently in various ITLET systems (e.g., learning management, HR, national occupational classification,
 224 and other related systems);
 225

226 **Example 3: Information exchange** - Skills and competency proficiency information, such as individual
 227 status or degrees acquired, cannot be shared easily amongst different ITLET systems (e.g., HR, learning
 228 management, national occupational classification, and other related systems);
 229

230 **Example 4: Individual learner** - Individual developmental learning, education, and training paths cannot
 231 easily migrate or be exchanged amongst ITLET systems;
 232

233 **Example 5: Systems perspective** (where systems include individuals, organizations, and the
 234 technologies that support them) - Individuals and organizations cannot easily design and integrate
 235 informal and formal learning, education, and training opportunities to support life goals, career strategies,
 236 and career paths using existing common dimensions within ITLET systems;
 237

238 **Example 6: Practical analytics** - The ability to access, extract, and analyze competency and associated
 239 information can provide evidence as to whether learning, education and training information needs are
 240 being met in order to analyze lifelong learning, thus where competency information must be drawn from
 241 different systems and where non-interoperable format and definitions are used;
 242

243 **Example 7: Assessment and evaluation** - ITLET systems (e.g., acknowledgement and consideration
 244 are needed regarding evaluation biases in human assessment, the use of varying methods and metrics to
 245 evaluate human performance, and the need to conduct accurate skill gap analysis), where ITLET systems
 246 that use different competency digital schema are involved; and,
 247

248 **Example 8: Overarching goals and outcomes** - Human assessment and support for the development of
 249 human potential requires ITLET systems that provide a more flexible, holistic integration and exchange of
 250 competency and associated information beyond individual learning opportunities, everyday operation, and
 251 work performance. Competency data must be generated.
 252

253 Some of these identified problems have been addressed on a limited basis by the standards and
 254 specifications produced by the organizations mentioned above. Not only is it difficult to use these
 255 standards and specifications; however, but also the unsolved problems are still critical. It is still confusing
 256 for stakeholders to implement and use these standards and specifications. Also, various problems
 257 associated with ITLET related systems, which should be solved by or supported with information
 258 technology, still remain.
 259

260 Currently, organizations, such as schools, universities, institutes, and companies, use different ITLET
 261 systems to support the use of learning content, to enable and enhance various learning activities, and to
 262 provide other services. To meet their mission and goals, such organizations may rely on in-house
 263 developers, others such as ITLET vendors or suppliers, or a combination of both to provide and operate IT
 264 systems to support LET. This means ITLET operations and other organizational systems that deal with
 265 skills and competency information, such as interrelated human resources (HR) information systems, need

266 to be interoperable to allow for communication between organizations, their employees, and outsourcing
 267 ITLET providers or suppliers.

268 The purpose of this three-part International Standard is to provide a framework, models, system
 269 architecture used for competency and proficiency information, and a way to aggregate competency
 270 information. This standard will provide a general framework and information model to manage and
 271 exchange information about knowledge, skills, ability, attitude, and educational objectives. Especially this
 272 International Standard will focus on extending the concepts contained within ISO/IEC TR 24763 by
 273 providing more detailed information regarding competency information and its information aggregation.
 274 This multi-part standard may be used by software developers and implementers, instructional designers
 275 and test designers, and others to ensure that learning, education and training environments satisfy
 276 learners' and organizations' competency needs. In addition, this International Standard will provide
 277 definitions of several types of competency information aggregation, which will provide guidance for all
 278 stakeholders to better understand and support the development of interoperable systems that will enable
 279 competency information exchange.

280

281 **Information Technology for Learning, Education and Training —** 282 **Information Model for Competency — Part 1: Competency** 283 **General Framework and Information Model**

284 **1 Scope**

285 **1.1 General**

286 ISO/IEC 20006-1 provides

- 287 • A general framework for dealing with competency information in information technology for learning,
 288 education, and training (ITLET) contexts;
- 289 • A system architecture for managing and exchanging competency information and its related objects.
- 290 • An information model for expressing competency and its related objects that includes an introduction
 291 to the composition of
 - 292 ○ Basic competency information;
 - 293 ○ Semantic competency information; and,
 - 294 ○ Supplemental competency information.
- 295 • Use cases used to support the development of the general framework and competency information
 296 model.

297
 298 This standard is for those who design and use learning systems and human resources systems to support
 299 management and exchange of competency information using ITLET systems.

300 NOTE: This international standard is related to the Conceptual Reference Model developed in ISO/IEC TR
 301 24763. Information regarding the relationships between the ISO/IEC 20006 and ISO/IEC TR 24763 is
 302 provided in this standard.

303 This multi-part International Standard also includes the following parts:

- 304 ISO/IEC 20006-2 – Information Technology for Learning, Education and Training – Information Model for
 305 Competency – Part 2: Proficiency Level Information Model (IMC-P), which provides:
- 306 • Information model for expressing semantics of competency proficiency levels; and,
 - 307 • Use cases used to support the development of the competency proficiency level information model.

308
 309 and,

ISO/IEC TS 20006-3 – Information Technology for Learning, Education and Training – Information Model for Competency – Part 3: Guidelines for Aggregation of Competency Information and Data (IMC-A), which provides

- Guidelines and a data driven architecture for the development of specific data models managing aggregation of competency information and related objects;
- Ways to aggregate competency information and its related object data; and,
- Use cases used to support the development of the guidelines for aggregation of competency information and competency data.¹

1.2 Exclusions

The scope of this International Standard does not include an in-depth technical review of issues related to:

- Adaptability to culture, language, and human functions;
- Security; and
- Authentication.

1.3 Areas not addressed

This International Standard currently does not address the following items:

- Privacy
- Accessibility

2 Conformance

The objective of this part of ISO/IEC 20006 is to support the management and exchange of competency information in a way that will promote interoperability and integration. The general framework and information model are based on the Conceptual Reference Model for Competency Information and Related Objects (CRM) (defined by ISO/IEC 24763). The CRM provides a toolkit that can be used to abstract and identify concepts used within IT systems to support the management and exchange of competency information across different HR, learning and training contexts. ISO/IEC 20006 builds upon the conceptual and abstract focus of ISO/IEC 24763 to provide a general framework, information architecture, competency information model and additional components.

To support competency management and development, competency information needs to be structured and described consistently to promote understanding, mutual communication and agreement. Competency information should be detailed in a way that is semantically robust and extensible. For the purposes of this standard, competency information is conformant with this International Standard if it adopts the information model and the element property notations specified in this International Standard. (The element property notations are defined in Clauses 6.3 – 6.5 and Clause 7).

A conforming notation may contain descriptions of meaning and context of competency information. In other words, it is intended to be extensible and may contain additional information elements of ISO/IEC 24763. For conformance to ISO/IEC 24763, classes for defining a competency in CRM competency are indicated with the following notation [En] where n = a number that refers to a class defined in ISO/IEC 24763 to assist with understanding the linkages and relationships between the CRM and this standard. For example, as noted in ISO/IEC 24763, E1 = Action, E2 = Actor, E3 = Competency, and so on.

¹ The terms competency information and competency data will be defined in ISO/IEC 20006-3.

350 **3 Normative references**

351 The following referenced documents are indispensable for the application of this document. For dated
352 references, only the edition cited applies. For undated references, the latest edition of the referenced
353 document (including any amendments) applies.

354 ISO/IEC 2382-36:2008 (E/F), Information Technology - Vocabulary - Part 36: Learning, Education and
355 Training.

356 **4 Terms and definitions**

357 For the purposes of this document, the following terms and definitions apply.

358 **[Project Co-editors Note: The terms and definitions for 4.2 competency aggregation, 4.3 competency**
359 **composition, 4.5 competency modeling, and 4.7 competency package italicized below are intended to**
360 **be used for ISO/IEC 20006-3. The terms and definitions for 4.14 method for competency assessment**
361 **and 4.15 metrics for competency assessment italicized below are terms that are related to ISO/IEC**
362 **19796-3. The intention is to provide potential implementers with an understanding of the terms and**
363 **definitions that are used for the 20006 series and also to indicate that this work is related to ongoing**
364 **SC36 work on quality. Another option would be to re-organize the Terms and Definitions section to**
365 **indicate the terms and definitions that are specific to other parts of the 20006 series and to 19796-3.**

366 **NBs are asked to decide whether these terms and definitions should be**

- 367 **1. included in ISO/IEC 20006-1 as they are currently listed;**
- 368 **2. included in ISO/IEC 20006-1 in a separate section of the terms and definitions; or**
- 369 **3. removed from ISO/IEC 20006-1.**

370 **NBs are also asked to decide if the terms and definitions 4.x1 competency definition and 4.x2**
371 **competency framework (which the U.K. suggests would replace 4.6 competency organization), and**
372 **4.x3 sub-competency should be added to this clause.]**

373 **4.1 a (previous agreed upon version)** 374 **competency**

375 ability of an actor to perform (a) necessary action(s) in (a) given context(s) to achieve (a) specific outcome(s)

376 Note 1 to entry: The definition refers to ISO/IEC 24763:2011 (2.2), but the terms of observable or measurable before
377 ability were deleted to allow for more general usage and application.

378 **4.1 b (suggestion from Australian N.B.)** 379 **competency**

380 demonstrated (or, implied or presumed) ability of a person (or an entity) to accomplish the task-in-question (or
381 a given task) at a certain satisfactory level

382 Note 1 to entry: The definition refers to ISO/IEC 24763:2011 (2.2), but the terms of observable or measurable before
383 ability were deleted and actors was changed to person (or an entity) and the concept of level was added to allow for more
384 general usage and application.

385 Note 2 to entry: Context is implied, so there is no need to use the word context.

386 **4.2 a (previous agreed upon version)** 387 **competency aggregation**

388 *any way of uniting competency expressions (4.4) for identifying and exchanging competency (4.1) information*

389 **4.2 b (suggestion from Australian N.B.)**

390 **competency aggregation**

391 *collection of competency expressions (4.4) that is in any structure*

392 **4.3**

393 **competency composition**

394 *unit and aggregation type that consists of structured relationships of elements and attributes used to express*
395 *information content related to competency (4.1)*

396 *Note 1 to entry: For example, this may include information related to competency such as identification, semantics, context,*
397 *and supplemental.*

398 **4.x1 (addition suggested by U.K. N.B.)**

399 **competency definition**

400 *specification of a disposition that, when attributed to an actor, can be used to predict the extent to which that*
401 *actor will perform in such a way as to produce one or more desirable outcomes, when faced with a certain type*
402 *of challenge and contextual environment*

403 *Note 1 to entry: In common language, competency definitions may be referred to as abilities, capabilities, skills, knowledge*
404 *domains, aptitudes, attitudes or other terms that appear appropriate to a specific context.*

406 *Note 2 to entry: Competency is used to refer to the abstract definition. When applied to a particular actor, the term*
407 *proficiency should be used instead.*

408 **4.4**

409 **competency expression**

410 *any form of digitalized information regarding competency representation (4.8)*

411 **4.x2 (addition suggested by U.K. N.B.)**

412 **competency framework**

413 *group of related competency definitions structured to represent the essential relationships between the*
414 *individual competency definitions*

415 *Note 1 to entry: This may include structured sub competencies (e.g., competency information expressed as parent-child*
416 *relationships).*

417 *Note 2 to entry: Essential relationships refers to any relationship that is required in order to understand the full meaning of*
418 *the individual competencies that constitute the framework.*

419 **4.5a**

420 **competency modeling (previous agreed upon version)**

421 *ways and methods to identify competency organization (4.6) structure and/or each competency definition for*
422 *targeted group(s) or population(s)*

423 *Note 1 to entry: These targeted groups or populations typically include public organizations, private companies, industries,*
424 *and schools*

425 **4.5b**

426 **competency modeling (suggestion from Australian N.B.)**

427 *act of determining the structure into which the competency expressions are organized*

428 **4.6**

429 **competency organization**

430 *digitized expression or map of aggregation type(s), that defines a designated unit as a set of competencies*
431 *(4.1)*

432 Note 1 to entry: This may include structured sub competencies (e.g., competency information expressed as parent-child
433 relationships).

434 **4.7**

435 **competency package**

436 *standardized way to identify and exchange a set of data regarding competency (4.1) among different systems*
437 *or tools*

438 *Note 1 to entry: This standardized way may involve one of many aggregation types such as information regarding job, task,*
439 *role and so on, - because a competency may not only be expressed by competency content, in practice, it also may be*
440 *used with or by other information such as job, task, or role.*

441 **4.8**

442 **competency representation**

443 image and idea of *competency* (4.1) that occurs in a human mind.

444 Note 1 to entry: This is the real-world or portrayal or image or idea of competency as it is perceived by the
445 human mind; whereas, the competency expression is the actual digital manifestation, notation, statement of
446 competency. Representations include many different expressions.

447 **4.9**

448 **conceptual reference model**

449 common structure and definitions for describing the concepts and relationships within a system

450 [SOURCE: Adapted from ISO/IEC 24763:2011, 2.8.]

451 **4.10**

452 **data model**

453 graphical or lexical representation of data, specifying their properties, structure and inter-relationships

454 [SOURCE: Adapted from ISO/IEC 11179-3:2003, 3.2.11.]

455 **4.11**

456 **framework**

457 structure composed of related parts that are designed to support something

458 **4.12**

459 **information model**

460 expression of concepts, relationships, constraints, rules, and operations to specify data *semantics* (4.17) for a
461 chosen domain of discourse

462 Note 1 to entry: An information model can provide sharable, stable, and organized structure of information requirements
463 for the domain context.

464 **4.13**

465 **Information technology for learning, education and training system (ITLET system)**

466 set of one or more computers, devices, associated software, peripherals, terminals, human operations,
467 physical processes, personal needs and preferences profiles, information transfer means, that form an
468 autonomous whole, capable of performing information processing or information transfer to support learning,
469 education or training

470 [SOURCE: Adapted from ISO/IEC 14662: 2010, 3.13.]

471 **4.14**

472 **method for competency assessment**

473 instrument or tool to judge and/or to assess an acquired or demonstrated competency (4.1)

474 *Note 1 to entry: Methods include physical methods and abstract or conceptual methods. There are various*
475 *types of methods from the subjects of management science, pedagogy, psychology, engineering, statistics,*
476 *biology and others.*

477 *Note 2 to entry: "Measurement method" is a generic description of a logical sequence of operations used in a*
478 *measurement [ISO VIM: 2004].*

479 *Note 3 to entry: This definition is associated with ISO/IEC 19796-3 [ISO/IEC 19796: 2009].*

480 **4.15**
481 **metrics for competency assessment**

482 **[Project Co-editors Note: There are two definitions below. NBs please indicate your preference**
483 **in your voting comments.]**

484 a) material measure within some aspects of competency characteristics

485 *or*

486 b) material measure used to determine the value of specific aspects or characteristics of competency (4.1)

487 *Note 1 to entry: In other words, it is done as a way of assigning a certain value using methods of measuring or*
488 *testing in order to quantify a quality object from the standpoint of quality characteristics, such as scale,*
489 *criterion, degree, weight, magnitude, interval, ratio, standard rate, or others.*

490 *Note 2 to entry: "Material measure" is defined as device reproducing or supplying, in a permanent manner*
491 *during its use, quantities of given kinds, each with an assigned value [ISO VIM: 2004].*

492 *Note 3 to entry: In ISO/IEC 15939:2002, the metric is defined as "the defined measurement methods and the*
493 *measurement scale". However metric shall be clearly divided between the terms of method and scale to*
494 *support implementation for audit assessment and evaluation.*

495 *Note 4 to entry: This definition is associated with ISO/IEC 19796-3 [ISO/IEC 19796: 2009].*

496 **4.16**
497 **proficiency**

498 <ITLET competency> level or degree of a competency (4.1) by judgment or measurement

499 Note 1 to entry: OED defines proficiency as improvement in skill or knowledge; progress, advancement.

500 Note 2 to entry: Proficiency can be used to ascertain or to identify progress, advancement or improvement in a
501 competency, such as skill, knowledge, and other competency-related concepts.

502 **4.17**
503 **semantics**

504 branch of linguistic science that deals with the meanings of words

505 [SOURCE: ISO/IEC 11179-5:2005, 3.13.]

506 **4.x3**
507 **sub-competency (addition suggested by U.K. N.B.)**

508 competency definition (REF) that is nested within a competency framework (REF) as a child or a parental
509 competency definition

510 Note 1 to entry: Future versions of this standard may introduce different "roll-up rules", specifying different relationships
511 between a parent competency and its children. These rules would determine how the attainment of proficiency in sub-
512 competencies should be translated into the attainment of proficiency in the parent competency. In the absence of such
513 rules, it should be assumed that an actor's proficiency in the parental competency will equal the average proficiency
514 attained in all of the sub-competencies, with each sub-competency being given equal weighting.