

Competence Based Learning: Planning,
implementation, and accreditation

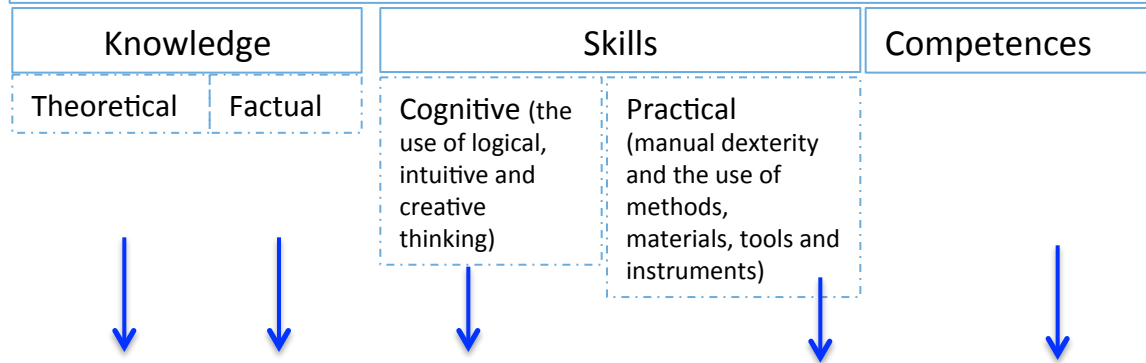
**The experience of the Integrated
Technical Education Cluster in Fayuom
and in Abu Ghaleb**

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Cairo, December 17th, 2020

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European Qualification Framework (EQF)



CURRICULUM DEVELOPMENT			
(1) Occupation standard	(2) Qualification standard	(3) Education standard	(4) Training or learning standard
Work activities are classified, described and assigned a level.	Descriptions of work activities are translated into statements of what learners should gain from education/training. These statements should be grouped into units (for the purposes of assessment/certification).	Learning outcomes are situated in an education context, for example: subject knowledge, content, assessment processes and events, institutional responsibilities, duration (hours, terms and years).	A plan for the teaching, learning and assessment activities that specifies in detail how learning outcomes will be achieved. The characters of teachers, resources, materials, tools, etc. are detailed.

Validation and certification

1. Occupational standards (1)

- A first group of occupational standards is based **on systematic work analysis** where there is **formulation of performance requirements the measurable**. The best example is the national occupational standard in the UK.
- A second group of occupational standards describes **the processes of producing product or delivery services** and competences. Spain, France and Italy are an example of this approach. This is a model typical for regulated systems, especially in TVET, where vocational qualifications are awarded by the state (sometimes in cooperation with social partners: e.g. France) or Regions (e.g. Emilia Romagna Region), and where one vocational qualification corresponds to one occupational profile.

Example: NOS/Qualification standard

Job Occupation/Qualification: Electrical Technician (level 3 EQF)

Competence Unit		Skills (capabilities)		Knowledge
TP 1.	Preparing for residential and industrial electrical installations	TPC1.1	Interpret technical drawings and layouts	<ul style="list-style-type: none"> • TPK01 - Electrical drawing • TPK02 - Principles of electrical engineering technology and installations • TPK03 - Principles of electronic engineering technology and installations • TPK04 - Types of electrical installations and electric equipment • TPK05 - Electrical equipment and materials for installations • TPK06 - Electrical equipment for measurement, control, and, protection • TPK07 - Modular and moulded-case equipment for boards and cabinets • TPK08 - Instruments and working tools and their use • TPK09 - Types of residential auxiliary installations and related equipment • TPK10 - Design and dimensioning techniques of electrical installations • TPK11 - Computer technology applied to diagnostic instruments • TPK12 - ISO, CEN, IEC (UNI and CEI) standards for electrical installations • TPK13 - Common principles and applied aspects of health and safety
		TPC1.2	Interpret specifications of equipment	
		TPC1.3	Identify materials, equipment and tools	
		TPC1.4	Estimate time and costs of electrical installations	
TP 2.	Setting up residential and industrial electrical installations	TPC2.1	Use electrical and other related data	
		TPC2.2	Apply assembling and wiring techniques	
		TPC2.3	Adopt setting up procedures	
		TPC2.4	Use instructions and procedures for assembling panels and cabinets	
TP 3.	Controlling residential and industrial electrical installations	TPC3.1	Select and adopt appropriate commissioning techniques	
		TPC3.2	Identify actions required to correct defects	
		TPC3.3	Assess the correct use of protection measures against electrical accident	
		TPC3.4	Record data and information of the commissioned installation	
TP 4.	Maintaining residential and industrial electrical installations	TPC4.1	Interpret signals related to malfunctioning situations	
		TPC4.2	Adopt simple maintenance techniques	
		TPC4.3	Select and use testing tools and techniques to restart operation	

Example: assessment standard

COMPETENCE UNIT	WHAT OBSERVE	INDICATORS	EXPECTED RESULTS	MODALITY
1. Preparing for residential and industrial electrical installations	All activities (steps) concerning the preparation of residential and industrial installation	<ul style="list-style-type: none"> ➤ Budget included time and costs 	Budget included a timetable, costs and operational activities drafted	Practical exam in applied context (workshop)
2. Setting up residential and industrial electrical installations	All activities (steps) concerning the setting up of residential and industrial installation	<ul style="list-style-type: none"> ➤ cabling ➤ assembling and setting up of electrical installation 	Residential and industrial installations installed	
3. Controlling residential and industrial electrical installations	All activities (steps) concerning the monitoring of residential and industrial installation	<ul style="list-style-type: none"> ➤ testing of the installation ➤ identifying and solving possible anomalies ➤ verifying the conformity to standard 	Installation tested according to save and efficiency standard	
4. Maintaining residential and industrial electrical installations	All activities (steps) concerning the maintenance of residential and industrial installation	<ul style="list-style-type: none"> ➤ Finding malfunction and anomalies of installations ➤ Replacement of defective and broken components 	Installation working according to the standard	

Example: Vocational Qualification standard

Job Occupation/Qualification: Electrical Technician (level 3 EQF)

Competence Unit		Skills (capabilities)		Knowledge
TP 1.	Preparing for residential and industrial electrical installations	TPC1.1	Interpret technical drawings and layouts	<ul style="list-style-type: none"> • TPK01 - Electrical drawing • TPK02 - Principles of electrical engineering technology and installations • TPK03 - Principles of electronic engineering technology and installations • TPK04 - Types of residential and industrial installations and related electric equipment • TPK05 - Electrical equipment and materials for installations • TPK06 - Electrical equipment for measurement, control, and protection • TPK07 - Modular and moulded-case equipment for boards and cabinets • TPK08 - Instruments and working tools and their use • TPK09 - Types of residential auxiliary installations and related equipment • TPK10 - Design and dimensioning techniques of electrical installations • TPK11 - Computer techniques applied to diagnostic instruments • TPK12 - ISO, CEN, IEC (UNI) and CEI) standards for electrical installations • TPK13 - Common principles and applied aspects of health and safety
		TPC1.2	Interpret specifications of	
		TPC1.3		
		TPC1.4		
TP 2.	Setting up residential and industrial electrical installation	TPC2.1	Apply assembling and wiring techniques	
		TPC2.2	Adopt setting up procedures	
		TPC2.3	Use instructions and procedure for assembling panels and cabinets	
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TP 3.	Controlling residential and industrial electrical installations	TPC3.1	Identify actions required to correct defects	
		TPC3.2	Assess the correct use of protection measures against electrical accident	
		TPC3.3	Record data and information of the commissioned installation	
		TPC3.4	Interpret signals related to malfunctioning situations	
TP 4.	Maintaining residential and industrial electrical installations	TPC4.1	Adopt simple maintenance techniques	
		TPC4.2		
		TPC4.3	Select and use testing tools and techniques to restart operation	

4 units of competence

Capabilities for each unit of competence

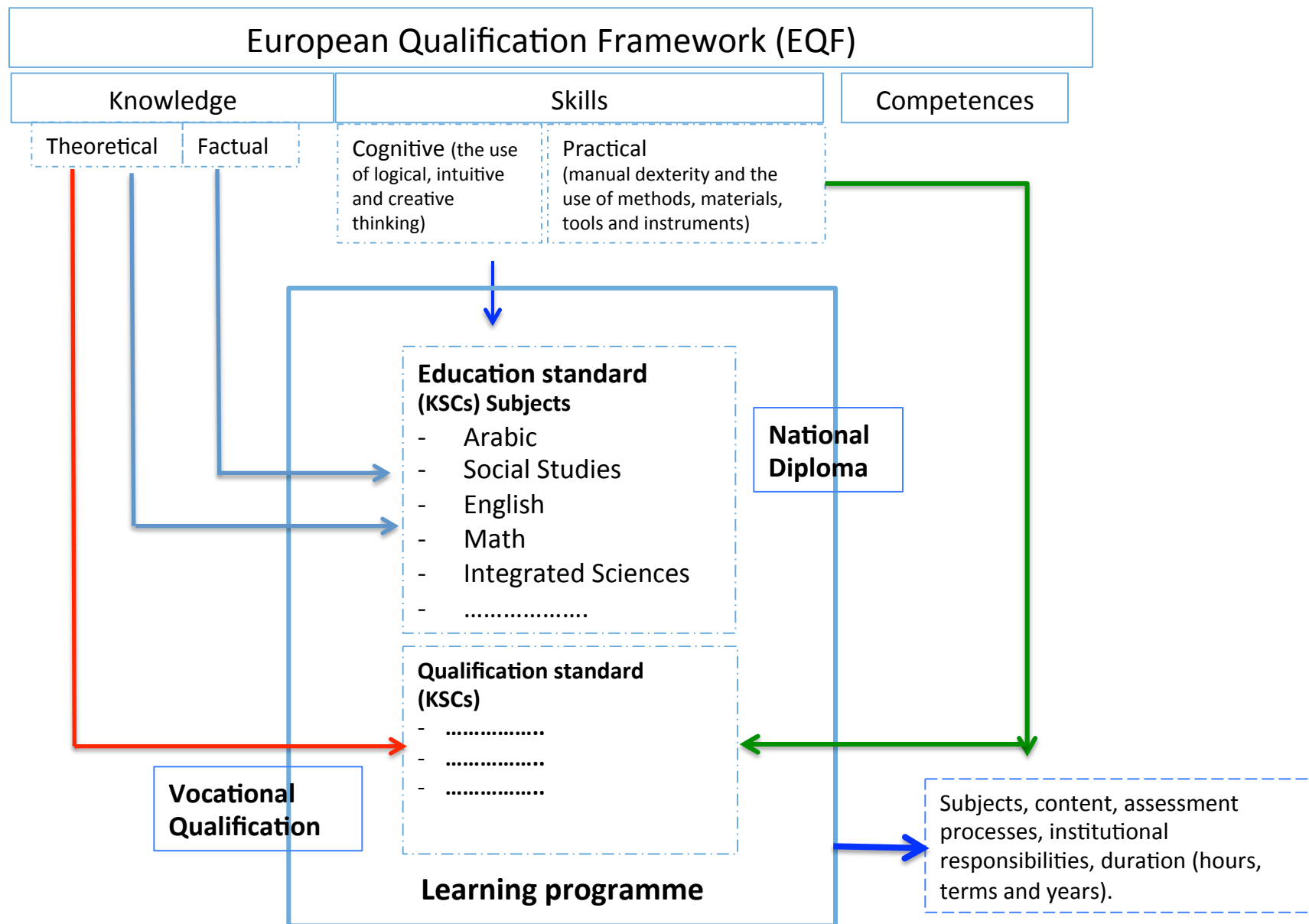
Descriptions of work activities are translated into statements of what learners should gain from education/training. These statements are grouped into units (for the purposes of assessment/certification).

Knowledge + Health and Safety in the working environment

Example: final assessment/certification standard

COMPETENCE UNIT	WHAT OBSERVE	INDICATORS	EXPECTED RESULTS	MODALITY
1. Preparing for residential and industrial electrical installations	All activities (steps) concerning the preparation of residential and industrial installation	<ul style="list-style-type: none"> ➤ Budget included time and costs 	Budget included a timetable, costs and operational activities drafted	Practical exam in applied context (workshop)
2. Setting up residential and industrial electrical installations	All activities (steps) concerning the setting up of residential and industrial installation	<ul style="list-style-type: none"> ➤ cabling ➤ assembling and setting up of electrical installation 	Residential and industrial installations installed	
3. Controlling residential and industrial electrical installations	All activities (steps) concerning the monitoring of residential and industrial installation	<ul style="list-style-type: none"> ➤ testing of the installation ➤ identifying and solving possible anomalies ➤ verifying the conformity to standard 	Installation tested according to save and efficiency standard	
4. Maintaining residential and industrial electrical installations	All activities (steps) concerning the maintenance of residential and industrial installation	<ul style="list-style-type: none"> ➤ Finding malfunction and anomalies of installations ➤ Replacement of defective and broken components 	Installation working according to the standard	

3. Education standard in Fayuom and Abu Ghaleb



Example Education standard

Job Occupation/Qualification: Electrical Technician (level 3 EQF)

Hours/week/term	1 st	2 nd	3 rd	4 th	5 th	6 th	total	
Number of weeks	14	14	14	10	10	14	76	
Arabic language	4	4	4	4	4	4	304	
Italian language	4	4	4	4	4	4	304	
English language	4	4	4	4	4	4	304	
Mathematics	4	4	4	4	4	4	304	
Integrated Sciences	2	2	2	2			104	
Physical Education	1	1	1	1	1	1	76	
Religious studies	1	1	1	1	1	1	76	
Social studies	1	1					28	
History	2	2	2	2	2	2	152	
Economy			1	1	1	1	48	
Education subjects	23	23	23	23	21	21	1700	
Technical and Professional	12	12	12	12	14	14	960	
Hours / term	1 st	2 nd	3 rd	4 th	5 th	6 th	total	%
Education subjects	322	322	322	230	210	294	1700	55%
Technical & Internship	168	168	168	280	300	196	1.280	41%
Assessment	22	22	22	22	22	22	132	4%
Total learning hours	512	512	512	532	532	512	3.112	100%

Learning outcomes are situated in an education context, for example: subjectduration (hours, terms and years).

Vocational Qualification

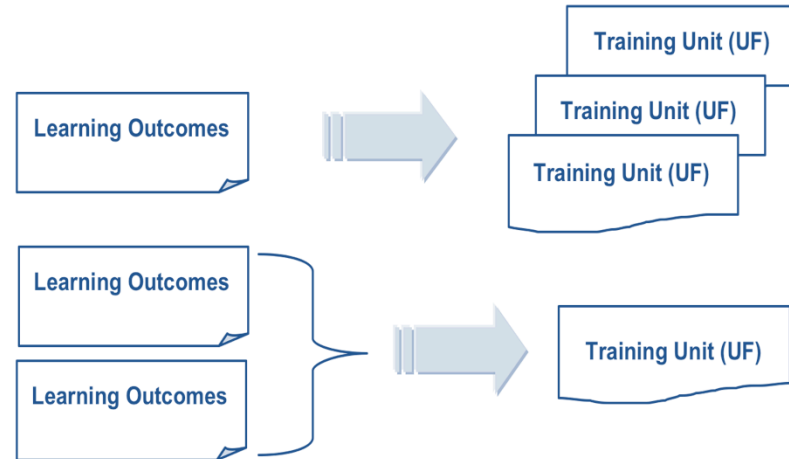
National diploma

(the Key competences for citizenship (problem solving, communication, ICT, collaborating, etc. are embedded within the cultural subjects such as, English)

4. Training or learning standard



A plan for the teaching, learning and assessment activities that specifies in detail how learning outcomes will be achieved. The characters of teachers, resources, materials, tools, etc. are detailed.

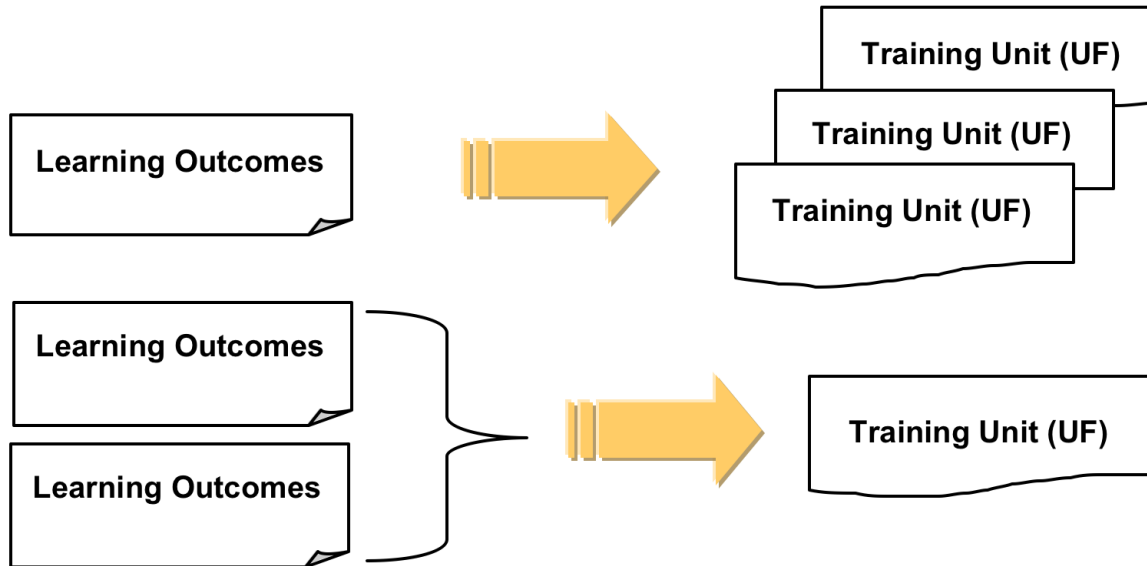


**Accreditation of school and/
or learning provider**

Accreditation criteria normally include:

- the adequacy of resources and equipment;
- the qualifications and experience of staff;
- arrangements for staff development;
- quality of programme design;
- evaluation process (formative and summative)
- effectiveness of liaison with employers;
- guidance and support for students;
- arrangements for students with special needs;
- effectiveness of recording and administration systems;
- quality of institutional management.

Training standard



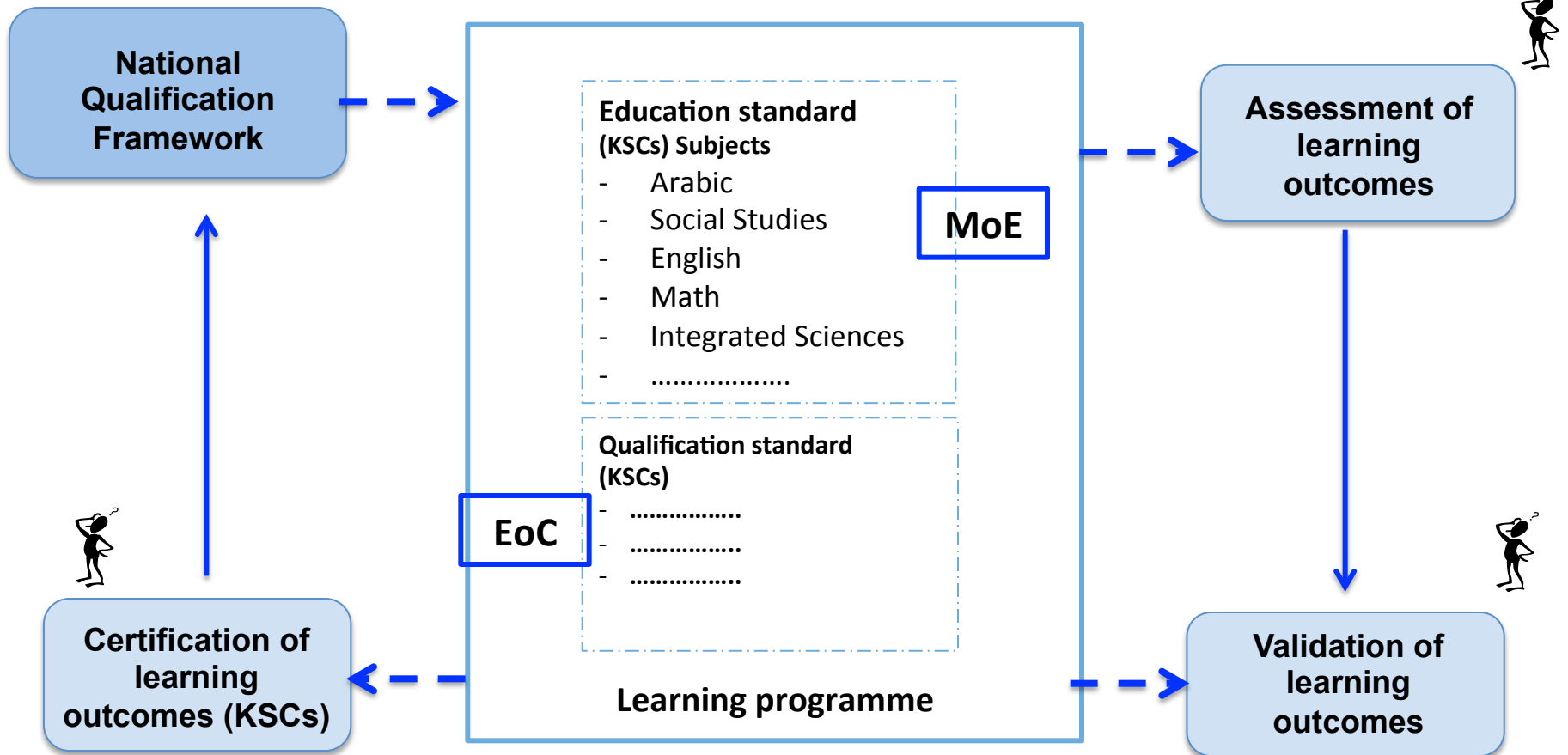
Training Units

Training Unit	Denomination	Guided Learning Hours		
		1 y	2 y	3 y
TP_1_01	Protection against electrical accidents	52		
TP_1_02	Residential lighting installations	52		
TP_1_03	Electrical power installations	39		
TP_1_04	Residential electrical panels	52		
TP_1_05	Residential auxiliary installations	52		
TP_1_06	Pipes and flat ducts installation	39		
TP_1_07	Installations	52		
TP_1_08	Residential electrical installation	39		
INT_1_01	Safety in the working environment	42		
TP_2_01	Panels on equipment with power control devices		52	
TP_2_02	Cabinets with power control devices		39	
IT_2_03	Diodes and AC/DC rectifiers		39	
IT_2_04	Transistors and amplifiers		52	
IT_2_05	220V AC/DC converters		39	
IT_2_06	220V DC/AC inverters		52	
IT_2_07	380V AC/AC inverters		39	
IT_2_08	Power Centre with power control devices maintenance		52	
INT_2_01	Realize and check electronic circuits		42	
INT_2_02	Realize a distribution panel board		35	
IT_3_01	Home Automation and Building management System (BMS)			45
IT_3_02	Realize an Intelligent Industrial Processes Control			60
IT_3_03	Industrial Processes Supervision - SCADA system			60
IT_3_04	Inside the PLC - CPU, Memories & IO Addressing			45
IT_3_05	Electro-Pneumatic control for robotics systems			60
IT_3_06	Water Desalination Stations Programming			45
IT_3_07	Automation Control Panel and the HMI (Human Machine Interface)			45
IT_3_08	Industrial Automation PLC Applications			60
INT_3_01	Realize an Home Automation System			42
INT_3_02	Industrial Automation Operator			35
Total Guided Learning Hours		419	441	497

Training standard

TU 1	Denomination/Title		
Brief description			
Competences			
Knowledge			
Unit Content			
Learning setting			
Learning resources			
Learning assessment modes			
Pre-requisite/entry level			
Guided Learning Hours	Theoretical	Practical	TOT
Credit points			TOT
Level			

Validation and certification



National Qualification Framework

Education standard (KSCs) Subjects

- Arabic
- Social Studies
- English
- Math
- Integrated Sciences
-

MoE

Qualification standard (KSCs)

EoC

Learning programme

Assessment of learning outcomes

Certification of learning outcomes (KSCs)

Validation of learning outcomes

Thank you

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