EUROPSKI KURIKULUMI ZA ELEKTROLUČNE POSTUPKE ZAVARIVANJA

European curricula for arc welding processes

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Ključne riječi: *elektrolučno zavarivanje, europski kurikulum*

Sažetak

Područje zavarivanja je jedno od specifičnih područja u kojem dominiraju diplome, certifikati i licence koje su izvan nadležnosti tijela javne vlasti ili pojednostavljeno, dominiraju međunarodne kvalifikacije. Provedene analize s aspekta stečenih kvalifikacija na nacionalnim i međunarodnoj razini pokazuju da su međunarodne kvalifikacije više usmjerene prema tržištu rada i da imaju veću vjerodostojnost kako za pojedince tako i za poslodavce. Do kvalifikacija se dolazi edukacijom kroz koju pojedinci stječu kompetencije. Nacionalni i međunarodni kurikulumi se razlikuju pa su rezultati različite kompetencije za isti posao i kroz to smanjena mogućnost mobilnosti na europskim prostorima, što je u suprotnosti s europskim politikama.
Takva saznanja dovela su do potrebe da se kroz novi pristup kroz standard zanimanja i standard kvalifikacije izgrade takvi inovativni europski kurikulumi koji će izgraditi poveznicu između nacionalnih i međunarodnih kvalifikacija. Izgrađeni sustav vrjednovanja rezultata obrazovanja omogućit će ujednačavanje kompetencija za isti posao na cijelom europskom prostoru.

Keywords: *Arc welding processes, European curricula*

Abstract

The area of welding is one of those specific areas dominated by diplomas, certificates and licences that are not under jurisdiction of public authorities or to put it simply, are dominated by international qualifications. The conducted analyses, from the aspect of acquired qualifications at national and international level, show that international qualifications are more directed towards the labor market and have higher credibility for both individuals and employers. Qualifications are obtained through education where individuals acquire specific competences. National and international curricula differ resulting in different competences for one and the same job and in diminished mobility of individuals throughout Europe, which is in collision with major European policies. This insight has brought about a need to design such innovative European curricula with a completely new approach through occupation and qualification standards that are meant to build a bridge between national and international qualifications. Such a well-constructed system for evaluation of educational results will enable harmonization of competences for one and the same job throughout entire Europe.

1. Introduction

Many companies at the European labor market are faced with the shortage of competent work force, while at the same time we have a high unemployment rate. Young people are not too keen to opt for VET. The same situation is in welding. Competent welders are high in demand at the labor market and young people do not opt for welding easily, so the average age of experienced welders is constantly rising.
A series of conducted analyses within our previous papers and projects have shown that:
- Young people have the wrong perception of welding as a "dirty" job,
- They are not in favor of most welding curricula because they consider them obsolete and
- Employers are not satisfied with the competences young people bring from their education path to the companies.

What can be concluded with certainty is that IIW and EWF have asserted themselves as an absolute authority in the area of joining technologies.
International welding qualifications have been defined in the following IIW recommendations:
- IAB-252r2-14/SV-00 - Minimum Requirements for the Education, Training, Examination and Qualification International Welding Engineers, Technologists, Specialists and Practitioners - Personnel with Qualification for Welding Coordination
- IAB-089r5-14 - Minimum Requirements for the Education, Training, Examination and Qualification of: International Welder (IW)

There are five levels of certification titles (international qualifications):

- European/international welding engineers (IWE/EWE),
- technologists (IWT/EWT),
- specialists (IWS/EWS),
- practitioners (IWP/EWP),
- welders (IW/EW)

What we can confirm with certainty is that the international welding qualifications in first three levels have been accepted in national qualification frameworks (NQF).
As for the remaining two levels, there are different approaches in different EU countries.[1]
Different approaches in welder training and education, different approach to qualifications in NQF and neglect of international qualifications in NQF bring about different (unequivalent) welder qualifications throughout Europe.
Very often the following ocurrs:
- Welder completes VET,
- Qualifications and competences are verified with issue of a diploma/certificate by an educational institution
- The acquired competences do not satisfy employers' requirements.
- The acquired competences in one country are not acceptable in another country – mobility is made impossible[2]

Result/consequence:
Some of these welders even when having satisfied the formal conditions (diploma) cannot find a job
Even greater discrepancies become obvious when work force moves/commutes within EU or even wider. Thank to their acquired competences, welders from some countries can work anywhere, whereas some welders can only work in their own countries. It is important to highlight here that

[1] Sources:
CEDEFOP: International Qualifications, 2012
Italo Fernandes: IIW/EWF System for Professional Qualification and its impact in metalworking companies in Europe, 2010
http://www.interactivweld.eu/documents/Dokument+No.1+IW.pdf, 2013
[2] https://www.maastrichtuniversity.nl/sites/default/files/downloadables/workshop_1_-_wes_-_stephanie_devisscher.pdf

beside different ways of education and training in some countries, resources they have at their disposal during the education (teaching materials) also play a significant role
For that reason we opted for design of European curricula for arc welding processes.

2. Foundation for design of European curricula architecture

The foundation for design of European curricula architecture is the integrated interactive system for lifelong education of welders S - K - S that was designed and adopted through a European Leonardo da Vinci partnership project and promoted to welding audience in 2015.[3]

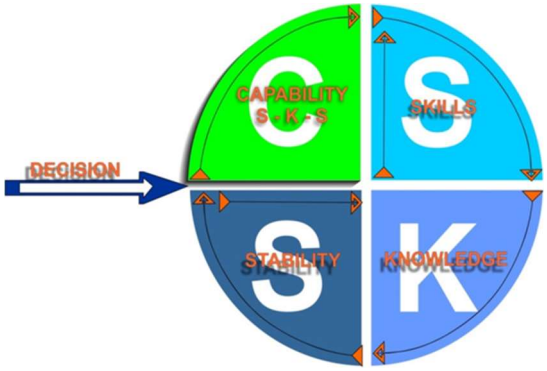

Figure 1 S – K – S system

The S - K - S was accepted as the foundation due to 4 significant features and its characteristics:
The features are:
1. S-K-S system relies on curriculum pedagogy, an important interdisciplinary area that is methodologically, structuraly and content-wise determined (designed) in relations to practical expectations.
2. Structural-modular model was chosen for the teaching process. Namely, in welding profession such a model is closely connected with the EQF and provides the necessary horizontal and vertical passageway.
3. Hybrid learning because it is a combination of best practices from the traditional and on-line education.
4. We-learning because it completely utilizes the social nature of learning.
Characteristics of the system are: uniformity, quality, continuity, compatibility, flexibility, dynamics, openness and availability.
Uniformity:
The system is based on the harmonized document IIW: IAB-089r5-15 IIW Guideline for International Welder: Minimum Requirements for the Education, Examination and Qualification.
Quality:
Quality is assured through two dimensions: personal and institutional.

[3] www.interactivweld.eu

Continuity:
The concept of lifelong education of welders ensures continuity in skills and knowledge and at the same time raises the level of their stability.
Compatibility:
The system is compatible with all welding processes and all VWTS.

Flexibility:
The system is flexible because it allows for adjustment of trainings to the demands of individuals or organization for who it is carried out, without the negative influence on quality.
Dynamics:
Individuals and organizations chose their own dynamics according to their own assessment.
Openness:
The system is open to trainees, professionals, hobby welders and the business sector. It is also open for all the new technologies and techniques that will in any way contribute to progress in welder education and to raising the quality of welding in general.
Availability:
The system is available to all interested parties without any restrictions.

The result of S - K - S system application in lifelong education of welders is visible in the comparison chart as compared with traditional education in Figure 2.

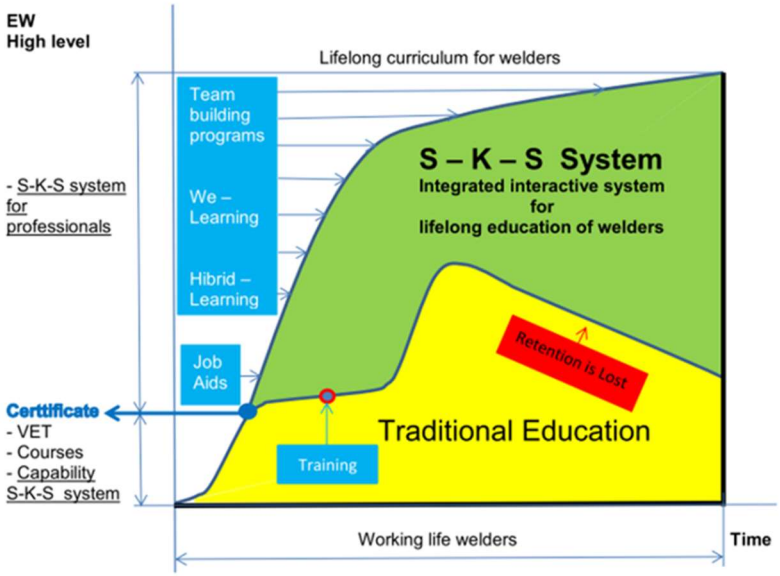

Figure 2 Comparison chart

3. Curricula architecture

The following figure depicts the European curricula architecture designed according to previously mentioned and explained elements with following constituents: S (Skills) – K (Knowledge) – S (Stability) System, Guideline IAB 089r5-15 and ISO TR 15608.

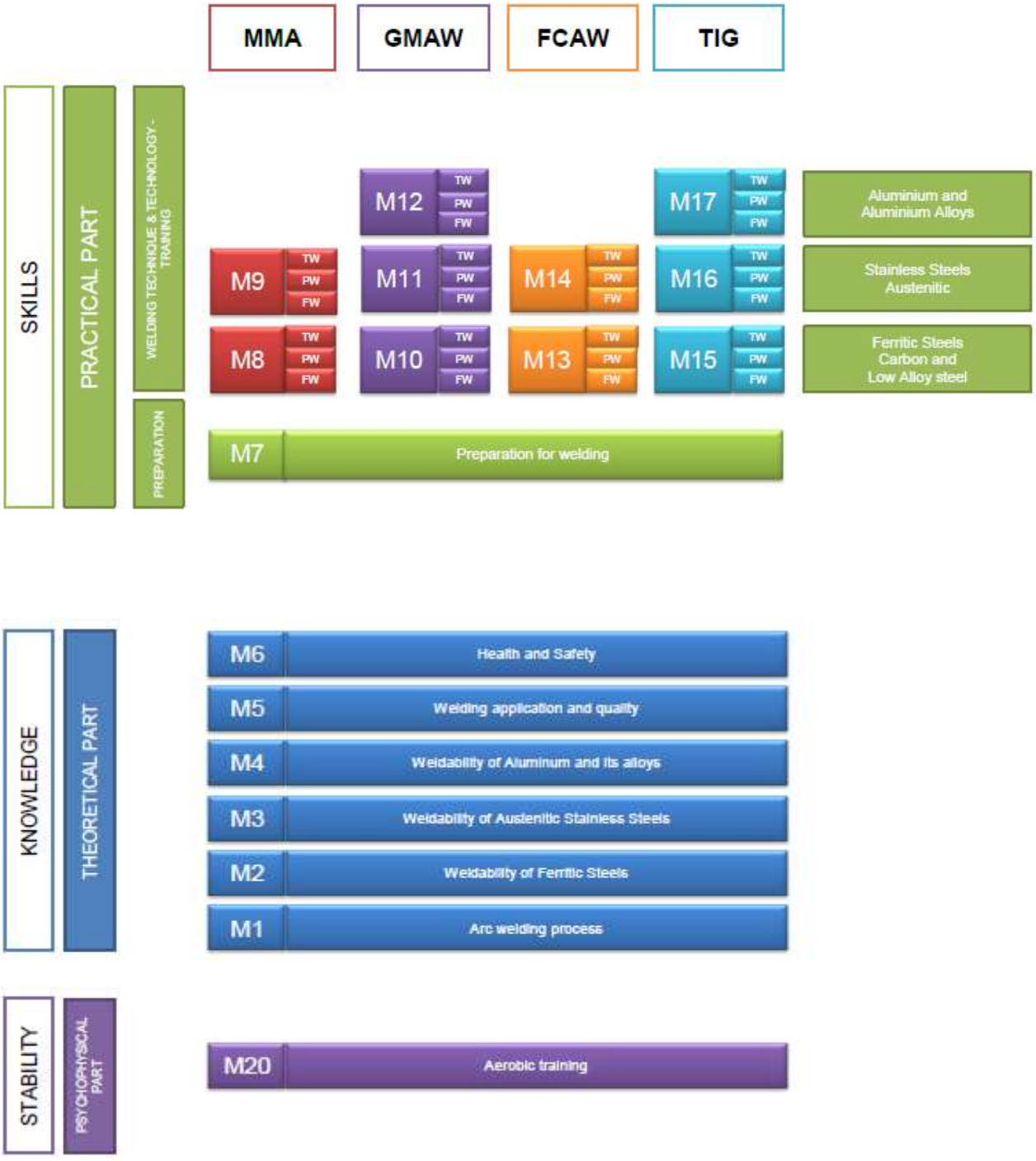

Figure 3 Curricula architecture

This figure demonstrates the linking of modules for acquisition of a demanded certificate intended for labor market.

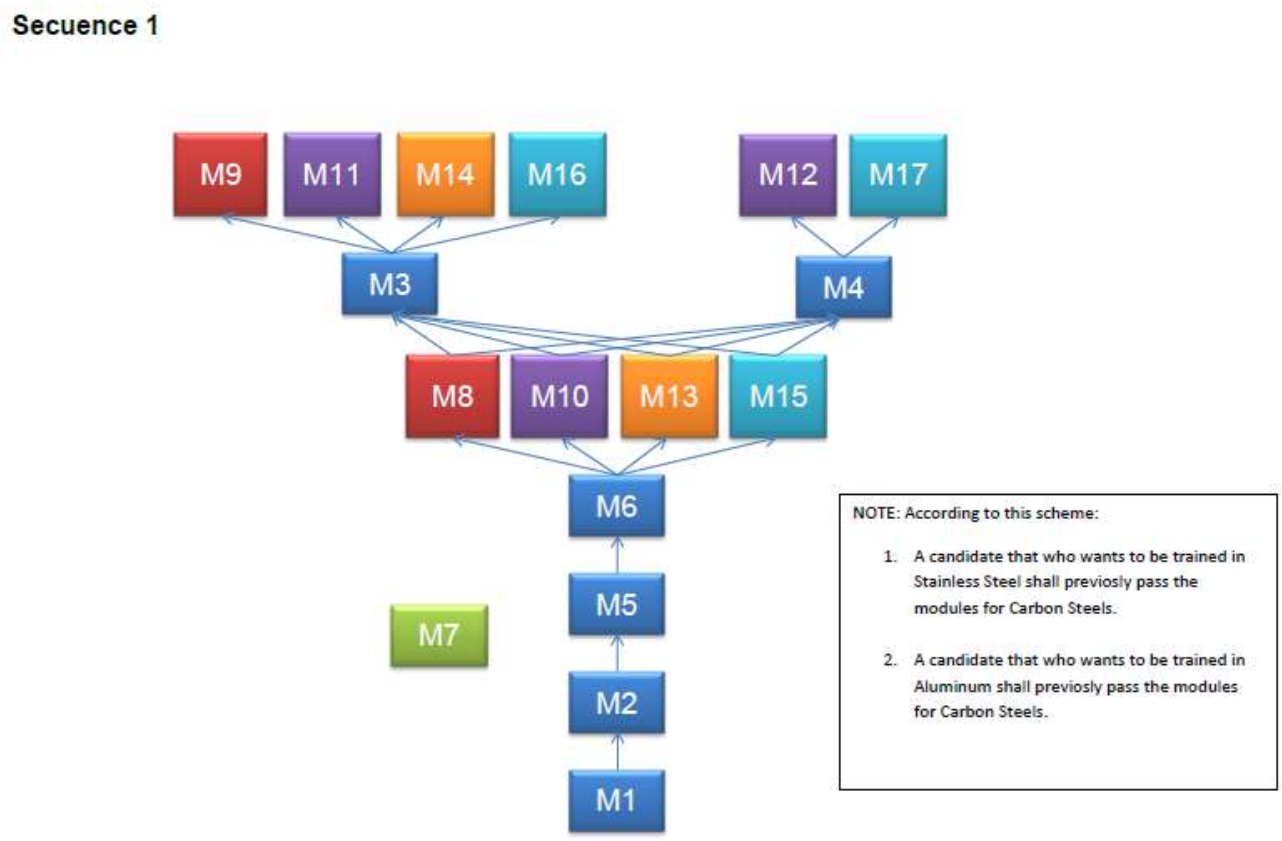

Figure 4 Linking of modules for a corresponding certificate

4. Conclusion

Design of curricula architecture was the first step towards creation of European curricula for arc welding processes.
The architecture itself shows that all the previously set objectives are accomplished:
- international qualifications are linked with the European and a pathway for transition to national levels was created,
- by linking the modules one is able to achieve a horizontal passageway through different welding processes, different types of joints and different materials and, at the same time, the path towards international certificates was made easier,
- vertical passageway is also made possible - the path to IWP or IWS depending on the previous level of primary or vocational education,
- both theoretical and practical part of education support introduction of VWTS and an interactive and modern approach to learning, thus catering to the demands of younger generations with regards to educational methods. The curricula will be available for public use by 31.08.2018 as a result of a European Erasmus+ KA2 Strategic partnership project “Welding is your chance” (Acronym: “WeldChance”) as a collaboration of experts from 5 European countries.

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