THE FUTURE OF PRINTING TECHNOLOGY ENGINEERS EDUCATION

Engineers are creators and inventors!

PREFACE

Printing industry is in rapid change phase, expanding for new technologies and materials to be used for pharmacy and food packaging, functional printing etc. The focus has change from the news and publications printing into direction of packaging and converting, to different printing businesses. For efficiency, as well as resource to new sustainable development goals has been implemented, but the goals of material safety and recyclability of the new materials often remains unclear for wide society. In this respect, the role of printing technology engineers cannot be underestimated by improving the awareness of brand owners, printing industry leaders and society – politicians and public opinion of citizens.

Keywords: printing technology engineer, engineering education, European Qualification Framework, cross-border mobility.

INTRODUCTION AND BACKGROUND

In the aging society and the wide range of the different attractions and high competition employ new people, the increment of young printing technology engineers are year-by-year is declining. Some background results are due the lower level of valuing the hard skills during the elementary or secondary education, especially at STEM subjects, some background influences are resulting of low image of the printing and packaging industry among politicians and public opinion of packaging impact to environment and nature. This has led to closers of printing technology educational programs at vocational and university level on different member countries of IC. The paper here is not aimed at addressing the whole complexity of social sciences, rather in the additional tools to establish different programs to engage young people from different university programs to continue their studies at printing technology engineering education programs at different IC member states universities.
The digital transformation of education lays the foundation that printing technology occupation's will listed hierarchical at International Standard Classification of Occupations (ISCO) in order to give structured overview occupations at printing industry.
Above all, the COVID-19 pandemic has accelerated the digital transition, global economy is in difficulties by exiting the Covid and from the 24.02.22 the war in Ukraine has place drastically seal to international relationships, cooperation and towards a sustainable future, affecting IC members as well.
The recent events has also significantly influenced the career opportunities for many people in the EU, globally and among the future view of perspective of IC young printing technology engineers.

METHODS

Base on undersigned early works from 2014 "Printing industry engineers education – cross-border development project" [1], has shown the solution is doable if the interesting parties are motivated and every player knows exactly what are the goals.
During the nearly decade the situation has drastically change not favour of the increased number of young talented printing technology engineers, but on the contrary – more programs has closed and less specialized printing technology engineers has graduated.
This has led into the situation where most important printing machine manufactures has opened their own Printing Academy's like: Koenig&Bauer Academy, Windmöller&Hölscher Academy, Comexi, BOBST ect. It is great initiative, but the orientation of those Academy's are mainly to supply with the professional

employees of own manufacturing company at level of mechanics and electrical technicians trainings, but not so much as printing technology subjects, if not special request made by manufacturer end customer. Referring above we have to define the difference of education vs. training, and can the printing press manufacturers Academy's take over the role of the vocational and university institutions?

The terminology adopted in the discussion [2]:

- EDUCATION - means structured learning advancement at university or a vocational education institution. The graduates will awarded a degree according to the European Qualification Framework, namely,
MSc = EQF7 (minimum 300 ECTS), sc. Second level of degree;
BSc = EQF6 (minimum 180 ECTS), sc. First level of degree;
or operator level EQF = 5 or 4 etc., after successful defence of a relevant thesis and examinations.
Such studies at university and vocational learning institution will provide theoretical and practical education based on a didactic learning curve rising from elementary to advanced, supported by cross-disciplinary science, technology, engineering and mathematics (STEM) subjects.
- TRAINING - means troubleshooting with one or a few competences to be improved for the trainee. A certificate of participation, sometimes with test of learnings, will follow training.

Unfortunately, often on different levels, even within professional Associations, mixing terms up and there by confusion is all too easily created. We have too long enjoyed riding the wave of news and publications printing, whilst failing to recognise that the world of printing was rapidly changed.
Therefore, our role at IC is to improve the printing technology engineering education with the existing universities among the IC global network. We have to be agile to implement new generation methods and digital transformation of printing technology-engineering education.
Young talents due to strong awareness not only choose the profession of printing technology engineers already in the early stages of their careers, but we also have to work hard to promote and introduce our profession to students of other related disciplines.
The work in here is based on implementation the globally reachable virtual engineering basic curricula's in Cloud, where global Virtual Engineers are mentoring the studies. The aim is to give access to all students in the world, who are interested to study basic theories of printing technology engineers.
After Cloud studies will follow the practical tasks at printing engineering universities among the IC network. Among the specialised printing technology engineering education, the new generation educational program support the graduated engineers ethics to share best practices of modern printing industry of packaging, functional printing etc. technologies among the brand owners, end users, national population etc.
The most important is the mobility of students to fulfil the practical tasks at IC universities or as apprentice engineers at industry, bring back field feedback to the Cloud educational program of printing technology to keep education on the latest level of requirements of the industry.

The secondary aim of wider student's involvement is to give young engineers an opportunity to participate at the global engineering associations and unions. Undersigned is a witness that among the European or World engineering organisations is very limited number of printing industry engineers, what is result then printing trade is not represented or underrepresented in engineering policy making at EU level, global sustainable development goals implementations etc.

CONCLUSIONS

The change has happened, and further change is already advancing upon us. The change from information printing to packaging and functional printing took many of the educational institutions by surprise, rendering their curricula less and less relevant. Only a few exceptions managed to re-focus onto functional and packaging printing technology research, and in doing so laid important ground work for the future affecting us all, but they alone could no longer cater for the required amount of trained talented engineers for that same future they were creating.
Role of printing technology engineers to implement the scientific results into the everyday manufacturing businesses is grown every day and increasing.

The main objective of work is to foster innovation and resilience among printing technology engineers through the acquisition of new competences - including different skills required by modern printing industry and leadership characteristics, with a focus on digital and green transformation of the printing industry, geared by the new requirements of the world engineering works.
Ethics of the Printing Technology Engineers push implementation of best practices at packaging manufacturing and improving the society awareness about the role of different packaging materials.

References

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ISBN 978-618-81734-0-8, 2014
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Author's biography

EUR Ing. Enn Kerner is MSc printing technology engineers graduated 1987 Moscow State of Printing Arts University, updated competences in packaging and flexo technology at DFTA and HdM Stuttgart, educator and teaching at Tallinn University and manufacturing leadership at Tallinn University of Technology.
Working closely with Aalto University researcher Prof. GANE team.
Since 2021 Enn Kerner is attributed with Certificate of EUROPEAN ENGINEER, issued by ENGINEERS EUROPE Association (former FEANI).
Working closely with Graphic Technology Research Association of FOGRA as Process Standard Printing Partner and active implementer of printing standards at industrial level.
Among professional activities EUR Ing. Enn Kerner actively working at voluntary sector like:
Advisory Board member of IC, Member of ENGINEERS EUROPE Strategic Working Group FUTURE ENGINEERS, vice-president at ESTONIAIN ASSOCIATION OF ENGINEERS and ect.