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Education development in the field of logistics
at the University of Miskolc

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Abstract: The Institute of Logistics of the University of Miskolc (and its ancestors) is dealing with the education and research related to material handling from 60 years, so the knowledge which is used to develop curricula for the subjects is proved and suitable. Staff of the Institute uses advanced devices to present the planning methods and demonstrate the operation of different handling machines, handling systems and other logistic processes. Unfortunately, the economic changes of the last decades required significant changings in the education structure and curricula of the logistic courses, and also in the research activities of the Institute. Beside it, to follow the development and new challenges of the advanced logistic environment, many new, computer aided methods and processes had to be applied. In this paper we summarize the history of the logistic education in Miskolc and draw the actual state and new challenges of the Institute of Logistics.

Keywords: Education, logistics, history, research

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1. Introduction

University of Miskolc is one of the largest higher education institutes of Hungary, with near nine thousand students and 1200 employers. The University has wide education and research profile at 7 Faculties and one independent Institute, more than 50 education directions and three levels (Bsc., MSc., PhD.) [1].

Logistics is a very important field of the industry and it has highlighted role in the advanced economic processes. University of Miskolc was the first in Hungary who established logistic education for students in 1986 led by József Cselényi. The logistic education started with some courses at the Faculty of Mechanical Engineering, then continued in modules and directions and developed into independent Logistics engineering. At this moment, the logistic education is managed by the Institute of Logistics, directed by Béla Illés.

This paper summarizes the history of the logistics education at the University of Miskolc and gives some outlook to the future challenges and actual tendencies.

2. Short history of the Institute of Logistics

The ancestor of the Institute of Logistics (Department of Lifting Machines) has been established in 1951 and dealt with the education of lifting machines and the transport and loading machines of mining processes.

In 1956, the name of the department is changed for Department of Transport Machines, and by the leading of Richárd Vankó and Imre Lévai (from 1966) it began to develop. The education involved all handling machines of the industry and then also the handling systems and processes. At the beginning, single courses dealt with the education of the material handling, however, in the middle of the seventies a Material handling specification was started. Material handling courses involved the most advanced techniques and mathematical methods for the optimisation of the handling machines using computer devices. The number of master thesis related to the profile of the

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Department was 30-35 pro year. During this period the Department was extended by an Automated Material Handling Laboratory [2].

In 1984, József Cselényi was nominated to be the head of the Department, and the role of the department was further strengthened, important research projects was worked out and the international relations were improved. Beside the Middle-East-European cooperation, new west-European relations were established (e. g. Germany).

The logistic education started in Hungary 30-35 years ago (see Figure 1), at first in Miskolc, and parallel with the education the scientific research also appeared (research projects, industrial development tasks, scientific papers, conferences, etc.). The widening of the activities was mirrored in the name of the department which changed for Department of Material Handling and Logistics from 1992 [2].

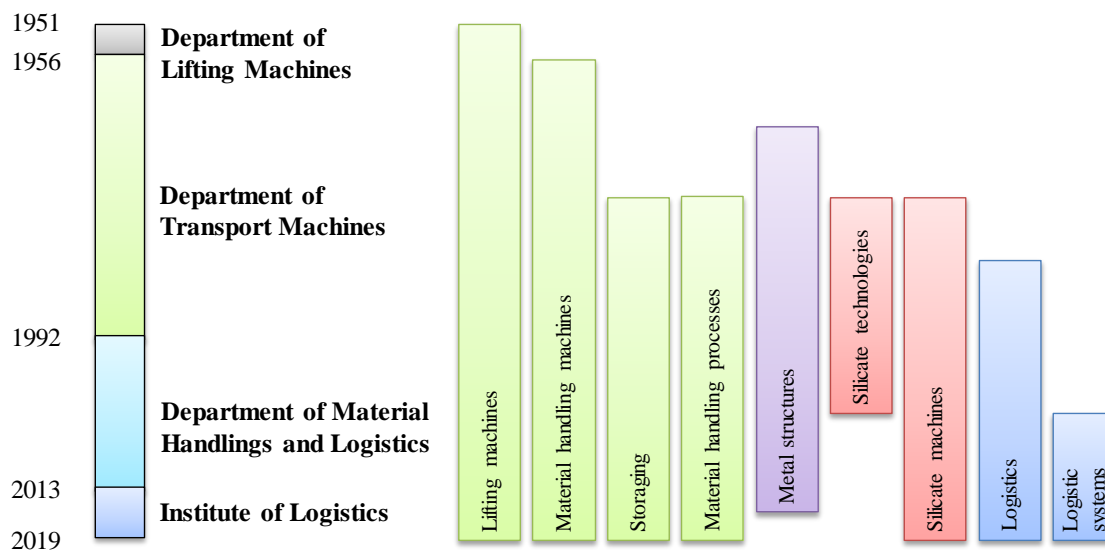


Figure 1. Changing of the education fields of the Institute (created by the author)

According to the international practice, new blocks were prepared for the IT engineering and Engineering management. Extending the education with the new directions and a correspondent education in the Mechanical engineering, the number of the final degrees reached 60-80 pro year at the BSc. and MSc. levels.

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From the beginning of the 90s the awarded national and international projects helped to strengthen the basic research and the new relations gave opportunities for staff and student exchanges (Dortmund, Magdeburg). In 1992 PhD education was started at the University, in which the department got opportunity for 4-5 students with logistic thesis. At the end of the 20th century, a scientific workgroup has been developed in logistics at the Department led by József Cselényi. At that time, the handling of the material flow and logistics became the dominant research and education fields of the Department, as it is also true for today [2]. In 1999, the department started a new Logistic manager education in the frame of the CNAM for postgraduate students, which gives international degree.

In 2001, Béla Illés take over the leading of the Department, which moved to increase the significance of the logistics following the development tendencies of the 21st century. In the new era, the role of logistics was changed, its weight increased in the industrial processes. From the 2000s, three PhD research field are belonging to the Department, and the students can take courses in English and German language at the Department. In the aspect of the researches, the establishing of two research centres supported the research activities of the staff.

The next step in the development of the Department was the starting of the education of Logistics engineering at MSc. level in 2010. Mirroring the weight of the logistics, the name of the department was changed for Institute of Logistics in 2013 and in 2015, the education of Logistics engineering also started in BSc. level. The last changing was the introduction of the dual education at the University, which affects the education structure and the students of the Institute, who can get practical knowledge at different logistic companies [3].

The Institute got an important opportunity in 2016, when a H2020 project (UMi-TWINN) had been awarded, which targeted to increase the scientific excellence of the University of Miskolc in the field of logistics. As a result of the project, many new research results involved into the curricula of the Institutes [4, 5, 6, 7].

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3. Developing of the logistic education in Miskolc

The education profile of the Institute of Logistics and its ancestors was continuously changing during the last 70 years, fitting to the changing of the industrial environment and requirements. At the beginning, the main targets were the lifting machines, then the education also involved the transport machines and the general material handling tasks. In the 70s, the weight point of the education moved from the machines to the handling processes and systems.

At the middle of the 80s, the education of the logistics was started, at first as a part of single material handling courses, then in individual logistics courses and from 1992 in a separate Material handling and logistics specialization. At the beginning of the 21st century, a new direction outlined in the education, to introduce the system concept into the logistics. In that time, new courses developed, as Logistic systems, Supplying and distribution logistics, Production logistics, Recycling logistics).

An important step of education activities of the Institute was the starting of the Logistics engineering in both levels, where the objectives were to build, develop and manage a complete education structure with many new courses (Figure 2.).

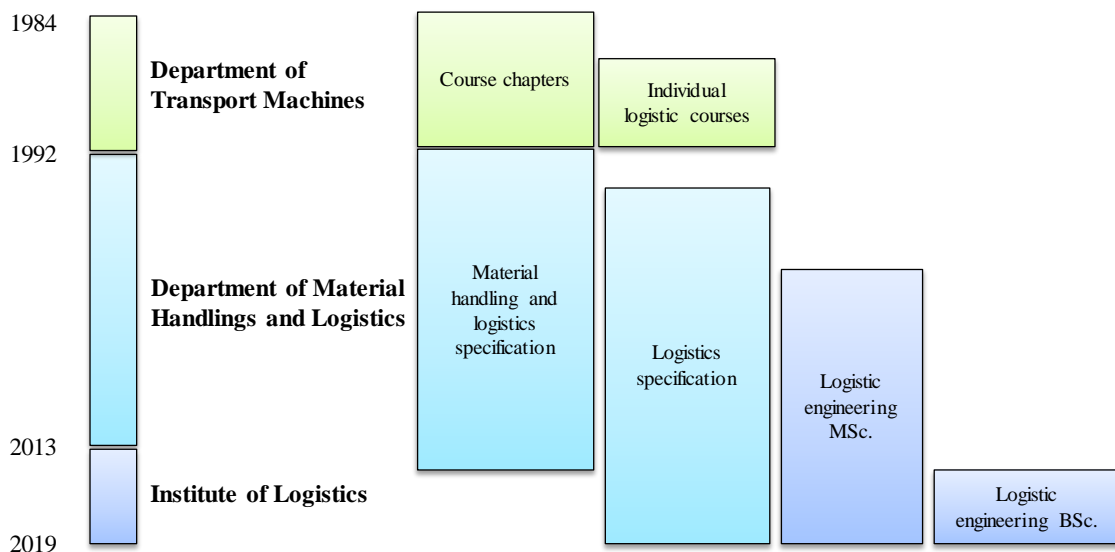


Figure 2. Developing of the logistic education (created by the author)

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According to the dual education structure of the University in the second decade of the 2000s, further development was required to fit the education courses to the new concept. The most important challenge of the actual industrial environment is the Industry 4.0 concept, which means the increasing of the using of digital techniques and computer solutions in the production and service processes. Following the changes logistics reacted to this requirement and the Logistic 4.0 concept also appeared. The Institute tries to apply new computer methods and devices in the research and education activities to fulfil the needs of the students and their employees.

4. Logistic education at the University of Miskolc today

During the last 7 decades, the Institute of Logistics and its ancestors tried to fit the requirement of the industrial-economic environment in the education and research activities. At this moment, the Institute has education activities on 7 education directions of two Faculties (Mechanical Engineering and Economics) and manages more than 60 courses in Hungarian, English and German language at BSc, MSc. and PhD. levels (Figure 3, 4).

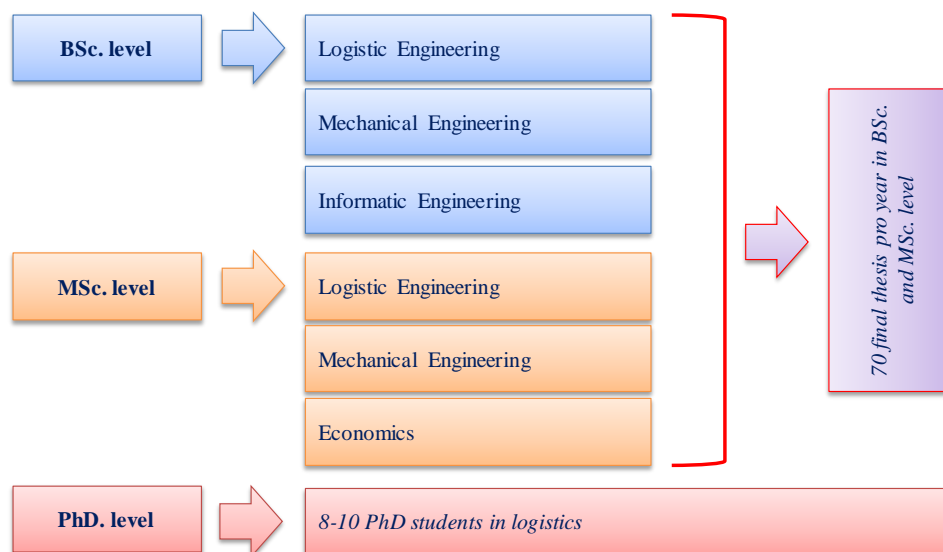


Figure 3. Education structure of the Institute of Logistics (created by the author)

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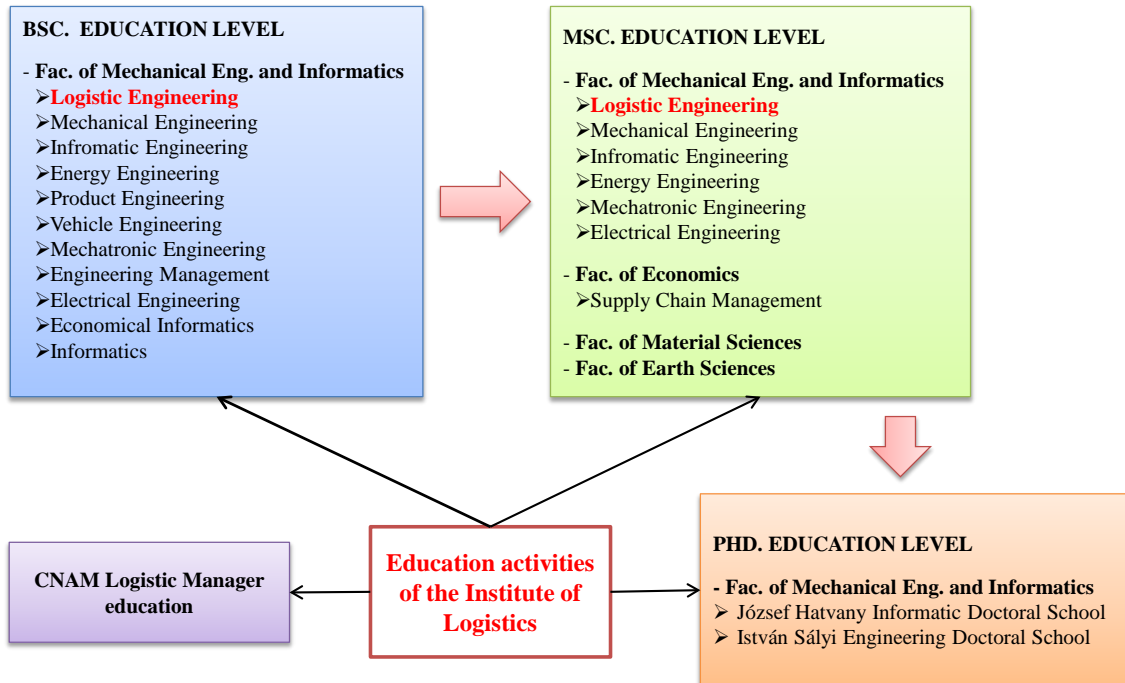


Figure 4. Logistic education at the University of Miskolc (created by the author)

The Institute of Logistics considers the practical education as a very important part of its education structure, so this Institute was the first at the University of Miskolc who joined to the dual education in 2015. At first, the dual education structure was introduced into the Logistic Engineering BSc., but from February of 2018 it also started at MSc. level.

The Dual education means a practice-oriented study, where the practical courses realized at high quality professional companies. As the visiting of the companies is possible only in certain days, this concept requires the transformation of the original education structure. The main objective of this study for the student is to gain professional, competitive competences, practical knowledge and company culture directly from a given firm. As a result of the dual education, students become high value employers for the companies. Beside it, students get significant practice (7 semesters in BSc., or 4 semesters in MSc.) and additional scholarship from the companies to support their studies.

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The Institute of Logistics has totally more than 60 courses at BSc, MSc. and PhD. levels (Table 1.).

Courses		
BSc.	MSc.	PhD.
Engineering Logistic Logistic Systems Material Handling Machines Logistic Information Systems Traffic Systems Quality Assurance in Logistics Service Logistics LEAN Logistics Recycling Logistics Legal regulation of Logistic Processes Material Flow Systems Transportation-Forwarding Optimization of Logistic Processes Storage Systems Material Flow and Warehousing Systems Simulation of Logistics Processes Maintenance Logistics Lean Production and Maintenance Production Logistics Ergonomics in Logistics Information Flow of Logistics Systems Controlling and Automation of Logistics Systems Design of Materials Handling and Warehousing Systems Logistics Machines and Equipment Global logistics Quality Assurance of Logistics Systems Recycling Logistics Processes Transport Activities Production and Service Logistics Processes Purchase and Distribution Logistics Processes Reliability of Logistics Systems Logistics of Flexible Manufacturing and Assembly Systems Logistics Service Providers, Industrial Parks	Service Logistics Maintenance Logistics Information Flow of Logistics Systems Controlling and Automation of Logistics Systems Design of Materials Handling and Warehousing Systems Logistics Machines and Equipment Global logistics Quality Assurance of Logistics Systems Recycling Logistics Processes Transport Activities Production and Service Logistics Processes Purchase and Distribution Logistics Processes Reliability of Logistics Systems Logistics of Flexible Manufacturing and Assembly Systems Logistics Service Providers, Industrial Parks	Theory of Material Handling Machines Elements of Material Handling Machines Theory of Storage Machines Automation of Material Handling Machines and systems Transport, Storing and Loading of Bulk Solids Theory of Material Flow Systems Dynamics of Material Handling Machines Theory of Material Flow Systems Theory of Logistics Systems Information Technology of Logistics Procurement and Distribution Logistics Production Logistics Logistics of Manufacturing Systems Service Logistics Logistics of Quality Assurance, Product Logistics Recycling Logistics Global Logistics Storage Systems Mathematical Models of Logistics Simulation of Material Flow and Logistics Transportation-Forwarding

Table 1. Logistic courses of the Institute [8]

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Of course, they are not individual courses, the structure of the different education levels related to each other, so in the same topics there are three different versions fitted to the requirement of the given knowledge level.

5. Conclusions

Logistics is a very important field of the industry and it has highlighted role in the advanced economic processes. University of Miskolc was the first in Hungary who established logistic education for students in 1986. The logistic education started with some courses, then continued in modules and directions and developed into independent Logistics engineering.

At this moment, the Institute has education activities on 7 education directions of two Faculties and manages more than 60 courses in Hungarian, English, German and Spanish language at BSc, MSc. and PhD. levels.

This paper summarizes the history of the logistics education at the University of Miskolc and gives some outlook to the future challenges and actual tendencies.

Nowadays, the most important challenge of the actual industrial environment is the Industry 4.0 concept, which means the increasing of the using of digital techniques and computer solutions in the production and service processes. The Institute tries to apply new computer methods and devices in the research and education activities to fulfil the needs of the students and their employees.

5. Bibliographical references

- [1] University of Miskolc. Retrieved from <http://www.uni-miskolc.hu/>
- [2] I. Lévai (2011) Anyagmozgatási és Logisztikai tanszék 1951-2011. Miskolci Egyetem
- [3] Institute of Logistics of University of Miskolc. Retrieved from <http://geik.uni-miskolc.hu/intezetek/LOG/index.php>

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- [4] B. Illés, Gy. Kovács, L. Czap. (2016) H2020 UMi-TWINN Project. COMEC 2016 Conference, Cuba, pp. 3
- [5] Illés, B. & Telek, P. (2017) Results of the UMI-TWINN Project During Months 1-15. In: Kékesi, T. (ed.) CD Proceedings of MultiScience - XXXI. microCAD International Multidisciplinary Scientific Conference. Paper: C1. 8, University of Miskolc, Hungary
- [6] P. Telek, B. Illés, C. Landschützer, F. Schenk, F. Massi: Material handling machines and systems – UMi-TWINN project contribution. Advanced Logistic Systems 12(1) (2018) pp. 7-20.
- [7] T. Bányai, B. Illés, C. Landschützer, F. Schenk, F. Massi: Cooperation in logistics technology research: how twinning project affects R+D in the field of logistic systems and networks. Advanced Logistic Systems 12(1) (2018) pp. 21-36.
- [8] Faculty of Mechanical Engineering and Informatics of University of Miskolc. Retrieved from <http://geik.uni-miskolc.hu/>

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