INTEGRATING ROMANIAN FOOTWEAR COMPANIES IN A SUSTAINABLE APPRENTICESHIP SYSTEM - EXAMPLE OF GOOD PRACTICE FROM PILOTING WORK BASED LEARNING

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INTEGRATING ROMANIAN FOOTWEAR COMPANIES IN A SUSTAINABLE APPRENTICESHIP SYSTEM AND EXPERIENCE FROM PILOTING WORK BASED LEARNING

ABSTRACT. The Work Based Learning (WBL) pilot stands on a Locally Developed Curriculum elaborated within a partnership consisting of an Educational Institution (Technical high school), Economic operator (Footwear company) and a Public institution (University) and serves as a good apprenticeship model for both, VET providers and footwear companies. The goal of this study is to describes the apprenticeship experience and the stages of implementing WBL in Romanian footwear company, namely: selection of apprentices, WBL pilot planning, tutors training on WBL, WBL pilot implementation, and formative quality assurance. WBL pilot programme in Romania was applied at Papucei footwear company and involved three young apprentices from "Ion Holban" Technical College of Iasi with background in Textile and Clothing field. During one year, according to the developed WBL pilot program and guided by previously trained tutors from Papucei and TUIASI, the apprentices followed all the Core Spheres (Cutting, Pre-stitching, Stitching, Pre-lasting, Lasting, Assembly and Finishing) and Peripheral Spheres (Technical Development, Production planning, design and Quality Assurance) specific to industrial footwear manufacturing. The apprentices' achievements were evaluated by the responsible tutors using the special designed Matrices found in the Manuals developed by ICSAS to support tutors involved in WBL process. The entire apprenticeship experience was then investigated and evaluated by relevant stakeholders using SWOT analysis to highlight the strengths, weaknesses, opportunities and threats.

KEY WORDS: apprenticeship, Work Based Learning (WBL), industrial footwear manufacturing, VET system, locally developed curriculum

INTEGRAREA COMPANIILOR ROMÂNEȘTI PRODUCĂTOARE DE ÎNCĂLȚĂMINTE ÎNTR-UN SISTEM SUSTENABIL DE UCENICIE ȘI PREZENTAREA EXPERIENȚEI DE PILOTARE A PROGRAMULUI DE ÎNVĂȚARE LA LOCUL DE MUNCĂ

REZUMAT. Pilotarea programului de învățare la locul de muncă (WBL - Work Based Learning) se bazează pe un curriculum dezvoltat local elaborat în cadrul unui parteneriat format dintr-o instituție de învățământ (liceu tehnic), operator economic (companie de încălțăminte) și o instituție publică (universitate). Programul de ucenicie servește drept exemplu de bune practici atât pentru formatorii VET, cât și pentru companiile producătoare de încălțăminte. Scopul acestei lucrări este de a descrie experiența programului și etapele implementării WBL într-o companie producătoare de încălțăminte din România, și anume: selecția ucenicilor, planificarea pilotării, instruirea tutorilor, implementarea pilotării și asigurarea formativă a calității. Pilotarea programului WBL în România s-a desfășurat în cadrul companiei Papucei și a implicat trei tineri ucenici de la Colegiul Tehnic "Ion Holban" din lași, cu studii în domeniul Textile și Îmbrăcăminte. Pe parcursul unui an, în conformitate cu programul dezvoltat și sub îndrumarea profesorilor și a tutorilor din cadrul Papucei și TUIASI, ucenicii au parcurs toate sferele de bază (croit, pregătit-cusut, cusut, pregătit tras-tălpuit, tras, tălpuit, finisat) și sferele periferice (dezvoltarea tehnică, planificarea producției, proiectarea și asigurarea calității) specifice fabricării industriale a încălțămintei. Progresul ucenicilor a fost evaluat de către formatorii responsabili aplicând matricele de evaluare concepute în acest scop și integrate în manualele elaborate în cadrul proiectului ICSAS pentru a sprijini tutorii implicați în procesul WBL. Întreaga experiență de ucenicie a fost apoi examinată și evaluată de părțile interesate folosind analiza SWOT și a evidențiari programului.

CUVINTE CHEIE: ucenicie, învățare la locul de muncă, fabricarea industrială a încălțămintei, sistemul de formare profesională, curriculum în dezvoltare locală

INTÉGRATION DES ENTREPRISES ROUMAINES DE FABRICATION DE CHAUSSURES DANS UN SYSTÈME D'APPRENTISSAGE DURABLE ET PRÉSENTATION DE L'EXPÉRIENCE DE PILOTAGE DU PROGRAMME D'APPRENTISSAGE SUR LE LIEU DE TRAVAIL

RÉSUMÉ. Le pilotage du programme d'apprentissage sur le lieu de travail (WBL - Work Based Learning) s'appuie sur un curriculum développé localement et créé en partenariat comprenant un établissement d'enseignement (lycée technique), un opérateur économique (entreprise de chaussures) et un établissement public (université). Le programme d'apprentissage est un exemple de bonne pratique pour les formateurs d'EFP et les entreprises de chaussures. Le but de cet article est de décrire l'expérience du programme et les étapes de la mise en œuvre du WBL dans une entreprise de chaussures en Roumanie, à savoir : la sélection des apprentis, la planification du pilotage, la formation des tuteurs, la mise en œuvre du pilotage et l'assurance qualité formative. Le pilotage du programme WBL en Roumanie a eu lieu au sein de l'entreprise Papucei et a impliqué trois jeunes apprentis du Collège technique « Ion Holban » de lași, avec des études dans le domaine du textile et de l'habillement. Pendant un an, selon le programme développé et sous la direction d'enseignants et de tuteurs de Papucei et TUIASI, les étudiants ont parcouru toutes les sphères de base (découpe, préparation pour la couture, couture, préparation pour le trage-montage, tirage, montage semelle, finition) et les domaines périphériques (développement technique, planification de la production, conception et assurance qualité) spécifiques à la fabrication industrielle de chaussures. Les progrès des apprentis ont été évalués par les formateurs responsables appliquant les matrices d'évaluation conçues à cet effet et intégrées dans les manuels développés dans le cadre du projet ICSAS pour soutenir les tuteurs impliqués dans le processus WBL. L'ensemble de l'expérience d'apprentissage a ensuite été examiné et évalué par les parties

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prenantes à l'aide de l'analyse SWOT et a mis en évidence les forces, les faiblesses, les opportunités et les menaces du programme. MOTS CLÉS : apprentissage, apprentissage sur le lieu de travail, fabrication industrielle de chaussures, système de formation professionnelle, programme de développement local

INTRODUCTION

The Report on Experience and SWOT from piloting Work Based Learning in Romania serves as "apparent good practice" for other footwear companies.

WBL pilot of apprenticeship is based on a Locally Developed Curriculum (LDC) [1], named "Footwear manufacturing technologies", elaborated by "Ion Holban" Technical College of Iasi (Educational Institution), SC Angela International SRL – Papucei (Economic operator), and "Gheorghe Asachi" Technical University of Iasi (Public institution - consultant) according to all Romanian Regulations [2-12].

WBL pilot programme in Romania was implemented at Papucei footwear company, lasted one year, starting from October 2018, and involved three apprentices from "Ion Holban" Technical College of Iasi [13].

The apprentices faced real work processes specific to the main spheres of activity of industrial footwear manufacturing:

- Core spheres (582h): Cutting, Prestitching, Stitching, Pre-lasting, Lasting, Assembly and Finishing;
- Peripheral sphere (72h): Technical Development, Production planning, design and Quality Assurance.

The apprentices' achievements were evaluated by the responsible tutors and their progress was documented and to further improve the WBL activity, the apprentices were asked to answer to a set of questions during an open interview to evaluate the atmosphere of the learning process.

The results of implementing WBL in Romania were shared and analysed during a workshop that gathered representants from TUIASI, Papucei, "Ion Holban" Highschool and CNDIPT (Romanian National Centre for the Development of Vocational and Technical Education). The experts shared their opinions regarding the implementation of WBL, the progress made by trainees, benefits and future collaborations. The results of the WBL pilot were evaluated through a SWOT analysis and are presented in the final chapter of this report.

IMPLEMENTING WORK BASED LEARNING IN ROMANIA

Selection of Apprentices

Apprentices engaged in the Work Based Learning have a background in Textile and Clothing and were selected from "Ion Holban" Technical High School from Iasi in collaboration with Papucei and TUIASI. Apprentices were evaluated in three stages: theoretical knowledge in the field, practical skills and interviews. From an initial number of six apprentices, the top three were selected based on their total score, as presented in Figure 1.



Students selection results for WBL

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No.	Student name and surname	Theoretical knowledge	Practical skills	Interviews	Total points	Final Result
1.		18	30	20	68	Reserve
2.		14	30	Absent	_	Absent
3.		16	50	20	86	Accepted
4.		13	60	20	93	Accepted
5.		16	50	20	86	Accepted
6.		15	50	20	85	Reserve

Figure 1. Apprentices selection results for WBL piloting in Romania

WBL Pilot Planning

The piloting phase had a duration of one year, scheduled during October 2018 - October 2019. The apprentices passed through all

spheres of activity and started on 22nd October 2018. Considering learning-teaching activities of each sphere, Papucei and TUIASI decided on the following distribution (Table 1):

Learning spheres	Learning content	Time distribution	Total hours
Core Spheres	Cutting	October - November 2018 5 weeks, 5 days/week, 6 h / day	150
	Pre-stitching	November – December 2018 3 weeks, 5 days/week, 6 h / day	90
	Stitching	December 2018 - February 2019 1 week, 5 days / week, 6 h / day + 7 weeks, 2 days / week, 6 h / day	115
	Pre-lasting and lasting	March - April 2019 7 weeks, 2 days/week, 6 h / day	84
	Assembly	June 2019 8 weeks, 2 days/week, 6 h / day	96
	Finishing	July 2019 4 weeks, 2 days/week, 6 h / day	48
Peripheral spheres	Design Technical development Quality assurance Production planning	September - October 2019 6 weeks, 2 days / week, 6 h / day	72

Table 1: Spheres distribution for piloting WBL

Sphere	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	January- Februaty 2019	Martch-April 2019	May-June 2019	July 2019	September- October 2019
No of hours	5x6=30	5x6=30	5x6=30	5x6=30	5x6=30	5x6=30	5x6=30	5x6=30	5x6=30	6 hours/day* 2days/week* 7weeks=84	6 hours/day* 2days/week* 7weeks=84	6 hours/day* 2days/week* 8weeks=96	6 hours/day* 2days/week* 4weeks=48	6 hours/day* 2days/week* 6weeks=72
Period	22-26	29 Oct-	5-9 Nov	12-16	19-23	26-30	3-7 Dec	10-14 D	17-21	Monday and				
	Oct	2 Nov		Nov	Nov	Nov		Dec	Dec	Thursday	Thurs day	Thursday	Thursday	Thursday
Cutting														
Pre-stitching														
Stitching														
Pre-lasting and Lasting														
Assembly														
Finishing														
Technical Development														
Production Planning														
Design														
Quality Assurance														

The detailed schedule of the WBL is presented in the following chart (Figure 2):

Figure 2. WBL pilot schedule in Romania

Tutors Training Workshop on WBL

The role of tutors is at the heart of apprenticeship programmes:

- passing on practical skills alongside with theoretical know-how;
- tutoring = internal knowledge management (& transfer) system;
- coaching apprentices = social responsibility;

• dealing with emotional ups and downs of teens.

Before the start of WBL pilot program in Romania, Tutors from Papucei footwear company were trained by representatives from TUIASI regarding the role of the tutors, the aim of the pilot activity, Train the Trainers manuals [14], Learning-Teaching Exercises [15], spheres of activity and WBT planning and coordination (Figure 3).





Figure 3. Train the Tutor workshop in Romania

WBL Pilot Implementation

According to the agreed WBL pilot program and guided by tutors from Papucei and TUIASI the apprentices followed all the Core Spheres (Figure 4) and the Peripheral Spheres (Figure 5) specific to industrial footwear manufacturing.

Core Spheres – 582 h

Cutting, Pre-stitching, Stitching, Prelasting, Lasting, Assembly and Finishing.







Stitching



Pre-lasting

Lasting



Finishing

Figure 4. Apprentices' during Core spheres WBL at Papucei

Peripheral Spheres – 72 h

Technical Development, Production planning, design and Quality Assurance.



Design

Technical development



Production planning

Quality Assurance

Figure 5. Apprentices' during Peripheral spheres WBL at Papucei

Regular Work Meetings at TUIASI

Additionally, WBL practical activities were backed up by regular meetings with the apprentices at TUIASI facilities (Figure 6) where

tutors provided counselling, asked for feedback to constantly improve the training and provided additional theoretical explanations of the tasks.



Figure 6. Apprentices' during regular meetings at TUIASI

Apprentices' Notebooks

containing drawings, samples explanations and observations.

Additionally, the apprentices documented all their work in individual notebooks (Figure 7)



Figure 7. Apprentices notebooks and footwear prototypes

Formative Quality Assurance

Learning Outcomes Feedback

For each sphere of activity, at the end of the training in that sphere, the apprentices' achievements were evaluated by the responsible tutors from TUIASI and Papucei by using the Matrices found in the Manuals developed by ICSAS to support tutors involved in WBL process [16].

For all learning spheres, the apprentices need instruction or supervision to perform the respective work tasks. None of the apprentices managed to receive the highest possible rating "Can perform all work tasks (almost) independently". This is justified by the age of the apprentices (16-17 years old), their learning pace in an actual work environment being slower compared with the learning pace of an adult and their limited theoretical knowledge in the field of Footwear industrial manufacturing. Therefore, it is recommended to adapt the number of allocated hours for WBL according to the age of the students and their theoretical knowledge. An example of filled matrices is presented in Figure 8.



Figure 8. Example of filled matrices from Cutting and Finishing

The main findings of the Romanian

apprentices learning outcomes assessment are presented in the following table (Table 2):

Learning sphere	Findings
Cutting	All apprentices need instructions and supervision for performing the requested tasks for manual cutting and die-cutting and that they need assistance for automatic cutting
Pre-stitching	Apprentices can read and understand work orders independently need additional instructions and supervision for making the adjustments on the skiving and splitting machines and that they need to be supervised during performing the majority of the pre-stitching operations.
Stitching	Apprentices need additional instructions and supervision for performing the majority of the stitching operations.
Pre-lasting and lasting	Apprentices can read and understand work orders independently, can perform the majority of operations independently or under supervision but need more practice to achieve the required quality. Regarding Lasting, due to the high complexity in operating the lasting machines the apprentices need further training in operating those machines.
Assembly	Apprentices can perform the majority of operations under supervision;
Finishing	Apprentices can perform the majority of operations but need supervision and additional practice to achieve the required quality.
Design	
Technical development	Allocated time was only sufficient to understand the main principles; therefore, apprentices need additional training in peripherical departments.
Quality assurance	
Production planning	

lable 2: Learning outcomes feedback main findings

Interviews with the Apprentices

To further improve the WBL activity, after their stay at each learning station, the apprentices were asked to answer a set of questions during an open interview to evaluate the atmosphere of the learning process. Example of interview with apprentices is presented in Figure 9.

The following questions were used during the interviews:

- Which LS (Learning Station) have you just completed?
- How long did you stay there?
- Was the time frame adequate or rather too long or too short? If it was not adequate, why?
- Do you feel proficient at this LS now? If not, why?
- Did you feel well prepared for this LS? If not, what was missing?
- Do you think that the entire learning potential of the LS was used? If not, why?
- Did the tutor support you in an adequate way? If not, why?
- Do you think that communication with colleagues was cooperative? If not, why?
- Were you part of a team or were you working on your own?

- Would you recommend your learning experience at this LS to other learners? Why?
- What could be improved?
- What was the most difficult task at this learning station?
- Were you able to put your theoretical knowledge from vocational school into practice at this LS? Did this LS help you to reinforce your understanding of theoretical knowledge?

Main findings:

- All learning spheres were recommended as being dynamic and interesting;
- Tutors provided adequate support and explained in detail all the operations;
- Allocated time was considered sufficient to learn main operations;
- More time to be allocated for exercising activities with a higher degree of complexity;
- Additional training and practice regarding machinery setup;
- The practice helped them to improve their understanding of theoretical knowledge;
- Experienced colleagues were always open to provide support and assistance.



Figure 9. Example of Interview with apprentices

SWOT Analysis of WBL in Romania

The implementation of WBL in Romania was analysed during a workshop that gathered 12 representatives from TUIASI, Papucei, "Ion Holban" Highschool and CNDIPT (Romanian National Center for the Development of Vocational and Technical Education) that shared their opinions regarding the implementation of WBL, the progress made by trainees, benefits and future collaboration. The results of the SWOT analysis [17] made during the workshop is presented in the following table (Table 3):

Table 3: Learning outcomes main findings

Strengths

- CDL objectives were achieved (CDL locally developed curriculum, a component of National Curriculum, includes
 allocated hours for the development of school-specific curriculum in partnership with private companies) the CDL
 was developed in implemented successfully, the trainees followed and passed all WBL spheres of activity and can be
 employed in a footwear company;
- The project facilitated the collaboration between Technical school Industry University
- Training Manuals and Learning-Teaching manuals have great value, both for the company and the school;
- Portfolios elaborated by the trainees have didactic use;
- Social impact: comparison between school ateliers and factory; integration in work teams, contact with workers from the company.
- Students learn how to follow a schedule, respect hierarchy, to be punctual, to communicate with colleagues, to follow work tasks;
- The training program and manuals are very useful for both school and companies.

Weaknesses

- Estimated and allocated hours for some of the departments: too many or too few hours; for example: were
 too many hours for the cutting and stitching departments while for the lasting department more hours would
 be required; The main explanation for this is represented by differences in the degree of difficulty between
 departments and the age of the trainees (very young, 15-16 years old). The maximum number of hours imposed by
 the national legislation has to be respected but hours can be reallocated between departments;
- Peripherical spheres: just a general introduction on these departments should be made, with few hours and the
 remaining hours should be allocated to the other departments. For example, to be proficient in Footwear Design or
 Technical development, a lot more hours are needed.

Opportunities

- The WBL programme can be successfully implemented in other footwear companies and technical schools from other regions from Romania.
- Papucei and "Ion Holban" Highschool will continue to develop and strengthen their collaboration in the next years;
- "Ion Holban" Highschool will use the project results to promote their educational offer to attract students from secondary school;

Threats

- Changes in Romanian legislation are unpredictable;
- The DUAL Romanian education system is not fully functional;
- The motivation of the young Romanian generation is generally low and their interest is hard to capture and maintain;



CONCLUSIONS

WBL pilot of apprenticeship based on a Locally Developed Curriculum (LDC) implemented at Papucei footwear company during one year and which involved three apprentices from "Ion Holban" Technical College of Iasi has received very positive feedback from the relevant stakeholders, including representatives from the footwear industry, experts in education, teachers, and tutors.

The results of implementing WBL in Romania demonstrate a sustainable model for adapting the professional training of youngsters through a complete training program covering all phases of footwear manufacturing.

The ICSAS apprenticeship model applied in Romania offers supportive resources for the development of the tools necessary for the application of dual training system. The presented apprenticeship-like scheme promises a relevant impact in the Romanian VET system and could be implemented by VET schools in partnership with the footwear companies. The training resources (curricula, sectoral framework, training manuals, tools for exercises and assessment, etc.) and agreement models are easy to be adapted to various particular situations and fields which makes it more valuable and sustainable.

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