

AUTO ACADEMY

Quality education improvements in automotive

The Best Practice by PP7 aims to improve conditions in teaching technical fields, including increasing students' motivation to study in these fields.

Auto Academy, as a real output of “best practice”, will develop students' key competences at vocational and training schools to simplify their integration and adoption into the working process. It will strengthen the employability of graduates and strengthen the consequently competitiveness of the automotive companies as well.

The added value of the best practice lays in the fact, that teachers themselves create the educational materials on the basis of manuals provided by external experts which increases their understanding and involvement. Also educational materials reflect the needs of industry to be learnt. To adopt the new educational materials, training games have been developed to fix the gained knowledge.

Key areas of education depend on regional industry requirements and regional strategic focus.

Best practice is divided into logical and chronological steps in order to secure sufficient and reliable outputs in terms of new version of Educational Textbooks as follows:

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1. Industry analysis of knowledge requirements

Goal	The modules specification is being based on top professional practical requests of people with long-term experience in the industry. Employers come to contact with all the departments and their requirements on workers. If the requirements are in consensus with other companies then the direct feedback turns into the opportunity to implement the best practice methodology.
Responsibility	<i>Coordinator in this initials phase encourages companies to define and specify the requirements of the missing knowledge reflecting current situation of the business processes.</i>
Duration	Depends on contacts and relations to companies
Output	List of defined requirement(s) of missing knowledge

2. High Schools interests in support of industry

Goal	Vocational and training schools are another important link to the successful goal. The very essential input is to transform school thinking according to industrial pace. In order to achieve a strategic regional or national goal educational and industrial vision has to be in line with each other.
Responsibility	<i>Coordinator encourages training or vocational schools to be opened to cooperate and follow industrial processes, to reserve capacities for further workshops and teachers training.</i>
Duration	Depends on contacts and relations to vocational and training schools
Output	Number of vocational and training schools willing to participate

3. Conclusion of Industrial needs and Educational capacities

Goal	<p>Organized meetings of both parties coordinated by Cluster sets the ground for further framework agreement of cooperation. Discussion is led to specify certain needs to clarify:</p> <ul style="list-style-type: none"> • subjects to be taught at schools, number of subjects, • scope of educational textbooks with practical illustration to be included (see the example : page 10-11) • external experts specification for exhaustive innovative manual elaboration in defined areas • organizational issues <ul style="list-style-type: none"> ➤ time plan definition, ➤ curriculum integration process ➤ manual studying provided by manual provider ➤ teacher training under the supervision of experts, ➤ revision of preliminary textbooks by industry, ➤ pilot verification, ➤ coaching to gain feedback, ➤ (activities will be specify in more details further on)
Responsibility	<i>Coordinator moderates the discussion of both parties, making note for the public procurement.</i>
Duration	Max 3 meetings to clarify the chosen area
Output	Public procurement document proposal.

4. Public procurement

<p>Goal</p>	<p>The user of the Best practice has to follow its own national law in public procurement. If the best practice is financed by “European Structural Funds” than it has to be followed by the operational guideline.</p> <p>The subject of the procurement is: “Creation of educational manual to improve conditions in teaching technical fields, including increasing students' motivation”</p> <p>Another part of the subject:</p> <ul style="list-style-type: none"> • Creation of educational games to be included reflecting latest theory and best practices • Practical illustrations in companies – tutorial to verify gained teachers knowledge
<p>Responsibility</p>	<p><i>Coordinator discloses the public procurement</i></p>
<p>Duration</p>	<p>Varies on national law and program guideline (approx. 2 months) Elaboration of manuals approx. 2-3 months</p>
<p>Output</p>	<p>Contract signed with the winner of public procurement – manual provider</p> <p>Required outputs:</p> <ul style="list-style-type: none"> • Educational manual that covers minimal scope defined in step no. 3) and be transformed into curriculum at vocational and training schools • Collection of practical examples following theoretical part of the textbooks • List of companies able to provide verification on site for teachers and students • Couching for teachers

5. Integration textbooks into curriculum

Goal	The very initiative is under control by vocational and training schools them selves. In order to integrate new textbooks and lessons into curriculum there have to be internal meeting of teacher organized led by principal. Verification of textbooks and lesson become a part of the semester curriculum, lessons are scheduled and teachers undergoing training are assigned.
Responsibility	<i>Principal and teachers and assigned administrator</i>
Duration	Depends on school individually, there inner decision process
Output	Schedule approval creation 300 students supported 16 assigned teachers for training

6. Training of Teachers

Goal	In relation with requirements of significant employers and businesses in the region lectures and teachers are trained under the supervision of specialists (manual provider). That allows them to get familiar with updated processes of current companies, the style of the concept, meaning of the sign, links and illustrations. Without this phase teaches wouldn't be able create a sufficient textbooks to be reviewed by industry requirements. Once they learn and understand different approaches the next phase of textbook creation can be feasible.
Responsibility	<i>Coordinator organizes premises and secures the training. Training is the responsibility of the provider of the manuals for teachers.</i>
Duration	1 week (can be divided into separate days)
Output	Trainings organized

7. Textbooks elaboration for students

Goal	This phase is dedicated to elaboration of textbooks for students in accord with educational manual. The added value to the elaboration is that teachers themselves adjust the content relevant to the focus and purpose of the school. Due to their involvement they consequently become more enthusiastic to share the wisdom. Teachers are no longer trapped in obsolete stereotypes. They understand their contribution in point of the practicality and applicability in real conditions. The drive and purpose of teachers is fulfilled.
Responsibility	<i>The result is the first concept of textbooks for students created by trained teachers.</i>
Duration	1 month
Output	First concept of textbooks

8. Revision of the first concept of textbooks by specialist

Goal	The final shape of the textbooks is made by professionals of companies. The amendments, little corrections are always made. Specialists are reviewing according to experience they take from real situations.
Responsibility	<i>2 specialist review one textbooks</i>
Duration	1 week to study the concept and plus 2 day for face2face clarification
Output	Revised textbook for pilot verification

9. Pilot verification

Goal	According to pre-prepared step in earlier stage of planning a pilot verification is taking place during the 2 semesters. There is an entering test later to be compared to the final one. That secures the improvement and knowledge application. Within the lessons taken there are 6 site visits to gain the notion of what is being taught. (there should be minimal 90 students attending). To motivate students in developing their knowledge the final contest has been held. The best students of selected schools have been priced by tickets to Brno motor Show.
Responsibility	<i>Responsible for the pilot verification are: principle, trained teachers, assigned administrator, coordinator, manual providers</i>
Duration	2 semesters
Output	Entering test 6 Site visit within companies Contest + award

10. Couching for teachers

Goal	Every two month there is a couching workshop led by manual provider in order to create high professional textbooks for students. Trained teachers have an opportunity to share the experience and to tune up the textbooks. There are approximately 4 hours dedicated to each subject. That gives the text book the final touch combined with real feedback to final verification.
Responsibility	<i>Responsibility lays in coordinator, who organizes workshops.</i>
Duration	Every 2 months 1 work shop is organized during 2 semesters
Output	4-5 workshops

11. Final verification of created and pilot verified textbooks for students by external specialist

Goal	This phase of the best practice defines the quality of the textbooks. The verification committee comprises of professionals of selected companies. Trained teachers and principal defend the final version of the textbooks.
Responsibility	<i>Coordinator and external specialist are responsible for organization and final result</i>
Duration	2 week to study the textbooks + 2 day committee session
Output	Final version acceptance

12. Certification of trained teachers

Goal	Every trained teacher receives a certificate to prove their ability to carry on dissemination of the high quality prepared content of the textbooks.
Responsibility	<i>Responsibility of coordinator</i>
Duration	0,5 day
Output	Certificates

13. Textbooks printing out

Goal	The amount of copies to be defined by each user of the best practice.
Responsibility	<i>Responsibility: depends on contractual conditions</i>
Duration	Depends on possibilities – might be another public procurement
Output	Final version being printed out

14. Termination of the best practice

Goal	Final report is being elaborated to summarize the process and outputs. There is final examination being held to prove the students improvement.
Responsibility	<i>Responsibility of coordinator</i>
Duration	2 weeks + 1 day final examination
Output	Activity, Financial Report Compared entering tests to the final tests enclosed to the reporting

Financial analysis and expenditures depend on scope of the manuals, number or participating schools. This issue is individual.

Best practice AUTO ACADEMY - Quality education improvements in automotives improves conditions in teaching technical fields, including increasing students' motivation to study in these fields.

It outlines all the necessary step with the goal need to be fulfilled by specific outputs, responsible persons and duration witch might also differ.

The most important milestone is the beginning of the PILOT VERIFICATION. Textbooks need to be prepared based on experts manuals, schedules need to be integrated into curriculum approved by principal along with the trained teachers.

Within the Auto Academy finalized according to the best practice there have been 5 key areas defined and integrated into curriculum:

- Lean Processes**
- Logistics**
- Project management**
- Leadership**
- Innovations**

Down below you can find the content of organized best practice in Lean processes companies found important to be taught at vocational and training schools.

15. Auto Academy – Lean Processes - Example

1 Lean Thinking

- 1.1 Lean Concept Establishment
- 1.2 Application Of Positive Principle
- 1.3 Value Definition Of A Consumer Perspective
- 1.4 Value Stream Identification
- 1.5 Value Stream Fluency
- 1.6 Principle Of Tension In The Value Stream

2 Lean Development Processes

- 2.1 Requirements Definition For Product
- 2.2 Transformation Of Product Requirements
- 2.3 Methods Used In The Development Process

3 Lean Manufacturing

- 3.1 Value Stream Mapping
- 3.2 Lean Layout
- 3.3 Lean Workplace
 - 3.3.1 Productivity In The Lean Workplace
 - 3.3.2 5s Method
 - 3.3.3 Introduction To Ergonomics
- 3.4 Lean Devices
 - 3.4.1 Total Productive Maintenance
 - 3.4.2 Tool Management (Management Tool)
 - 3.4.3 Fluid Management (Management Of Oil And Liquids)
 - 3.4.4 Smed - Reducing The Cast Time
 - 3.4.5 Jidoka - Equipment Autonomy
 - 3.4.6 Lcia - Low Cost Automation
 - 3.4.7 Poka - Yoke - Elements To Prevent Unintentional Human Mistakes
- 3.5 Standardized Work
- 3.6 Analysis And Measurement Of Work
 - 3.6.1 Methods Of Work Measurement
 - 3.6.2 Balancing Assembly Lines
- 3.7 Continuous, Even Production
 - 3.7.1 Principles Of Tension And Pressure In The Material Flow Management
 - 3.7.2 Kanban System
 - 3.7.3 Uniform Scheduling Of Product Mix
 - 3.7.4 One Piece Flow - Heijunka
- 3.8 Kaizen

4 Waste In Administration

- 4.1 Standards In Administration
- 4.2 Teamwork In Administration
- 4.3 Continuous Improvement In Administration

2S – Systematizace (Seiton) Na pracovišti se určí a vizuálně označí pozice pro uložení všech potřebných předmětů. Definují se skladovací místa a jejich kapacita, místa pro zařízení, nářadí, palety, pomůcky, komunikace a ostatní části pracoviště.



Postup druhé fáze – reorganizace a definice místa

Návrh pracoviště musí splňovat všechna kritéria na maximální efektivitu a produktivitu práce, ale zároveň musí taktéž splňovat požadavky na ergonomii a vysokou bezpečnost.

3S – Společné čištění (Seiso) Na pracovišti se definují oblasti, které je nutné v rámci daného teritoria pracoviště pravidelně čistit.



Definuje se:

- Co je nutné čistit
- Kdo bude čištění provádět
- Kdy a jak často
- Jakými prostředky se bude čištění provádět

4S – Standardizace (Seiketsu)

Vytvoření pravidel, jejichž účelem je dodržovat zavedené změny v krocích 2 a 3 a zabránit tak nedbalosti a návratu do stavu před aplikací metodiky 5S.

5S

Datum vydání: 24.9.2016
Linka 2 operace 1 (pracoviště pro 1 operátora)

Zóny ukládku obrazem s příklady	Přehled pracoviště a zóny ukládku
<p>Rozpis činností</p> <p>Na konci každé směny nebo po ukončení každé výroby musí obsluha uvést úklidové a uspořádací pracoviště do pořádku dle následujících pokynů:</p> <ol style="list-style-type: none"> 1. Všechny odpadní nádoby na odpad po odřevu vyčistit a seřadit (vyčistit, smést, osušit a pod). 2. Průhled a výhledové prvky v celé pracoviště a okolí umýt, přiložit zbytky lehu a nářadí pracoviště z místa. 3. Na každé směny nebo výroby uvést pracoviště a okolí v jeho celkové do správné polohy podle značení na podlahu. 4. Zkontrolovat správné umístění přístrojů pro každou dílu (značky) a přístrojů pro výrobu podle obrázků a ověřit značení na značce. 5. Město pro ukládání úklidových prostředků a odpadového kole na pracovišti udržovat rovněž uspořádané a v čistotě. 6. Staříka pro ukládání osobních věcí operátora. 	

Ukázka 5S standardu na pracovišti