



## Intellectual Output 2 – Activity 1

### Intellectual Output 2 – Activity 1 (IO2-A1)

#### Comparative report about the different official necessities and training studies

#### Final Report

#### WARSAW UNIVERSITY OF LIFE SCIENCES (WULS)

#### Table of Contents

Getting data from the interviews .....	2
LUCA CARUSO - “Sealine” .....	3
FRANCESCO BELVISI -YAM S.r.l .....	3
Domingo Tinoco .....	4
Salvador Tinoco - Mantenimiento Naval Tinoco .....	5
Mokol – Czesław Mowsiej .....	5
Celarek .....	5
Table of courses .....	7
Definitions of shipwright .....	8
Shipwright .....	8
Proposed issue of course .....	9
Profile the Shipwright student.....	10
Skills constituting a basis for education in professions .....	10
Starting and running a business.....	10
Skills underpinning vocational training.....	11
Results and discussion .....	11
Conclusions .....	12
Seasonality .....	12
Techniques.....	12
Staff.....	12
The possibility of selling boatbuilding services and products .....	13



## Getting data from the interviews

As part of one of the All Hand on Deck (AHOD) activities, recordings of interviews with representatives of the boatbuilder professions were made. The interviews were analyzed and as a result, valuable information on this profession was obtained. The interviews provided information on work, economics, management, production etc. Besides the basic that was conducted data illuminating the overall work of a boat builder, it is possible to specify information on problems that occur in the course of business activity. The acquired information was recorded in tabular form and as additions to the table. In the interviews current problems was presented related with business running, hiring new employees, selecting materials and using technology. The table main information are about the Partner Maritime Region Interviewed Country Theme of information.

Main information					
No.	Partner	Maritime Region	Interviewed	Country	Theme of information
1	CEIPES	Islands	LUCA CARUSO - "Sealine"	ITALY	Technical designer of luxury and sailing boats
2	CEIPES	Islands	FRANCESCO BELVISI -YAM S.r.l	ITALY	Project and technical manager of the company
3	CETEM	Intermediterranean	Domingo Tinoco	SPAIN	Caulk wooden ship`s or boats
4	CETEM	Intermediterranean	Salvador Tinoco - Mantenimiento Naval Tinoco	SPAIN	Tasks, materials and tool of shipwright in Spain
5	WULS	Baltic	Mowsiej	POLAND	Technology
6	WULS	Baltic	Celarek	POLAND	Technical and heritage



Information extracted from interviews IO1-A2						
No.	Maritime Region	Category of extracted information (concerning)				
		Canon of boatbuilding	Tool	Product , technique and material	Business	Customs, Interesting facts, stories
		Can	To	TeM	Bs	Sto
1	Islands		X	X	X	
2	Islands		X	X	X	
3	Intermediterranean		X	X	X	
4	Intermediterranean	X	X	X	X	X
5	Baltic		X	X	X	
6	Baltic	X	X	X		X

#### LUCA CARUSO - “Sealine”

Luca Caruso highlighted 3 important factors in his interview. The first concerns the acquisition of skills related to boat building. Luca said that the skills required in this area were not acquired in any regional course or even at the university. This makes us reflect on the type of courses provided and what exists in the field of boat building.

A second topic highlighted is the transition from traditional construction techniques to 4.0 ones, namely the use of numerical control technologies and Additive Manufacturing. Luca stated that the tradition of boat building has been lost not because there has not been a passing of notions but because we are witnessing a continuous technological evolution. Another aspect highlighted is that in Italy the business sector is certainly that of luxury boats. These represent real giant customized products, within which many workers from different sectors work, often not directly linked to the nautical sector.

#### FRANCESCO BELVISI -YAM S.r.l

Francesco Belvisi affirmed that he works with a lot of production techniques, from very innovative techniques not yet used, related to 3D printing, carbon fiber manufacturing, "generative design" and traditional ones related to wood. One of the most beautiful things he did at sea, was coming back to Pantelleria on a traditional and wood boat that he designed and built and also realised a kit of a modular boat in wood, economic and easy to assembly.



He affirmed that is very important in this field to study from sector manuals that are very complete, where it is possible to find can find all the information about wood, there is an endless literature on how to build wooden boats. He also affirmed that to get the same results nowadays it is necessary to use numerical control cutting tools or modern manufacturing techniques to simplify the process and to get the same result of the traditional boat.

Regarding the Sicily territory he affirmed that in the field of ship construction it is missing work approach structured companies. In Sicily, people are far from everyone, it is very difficult to develop innovative projects if you are far from new technologies, new materials, robotics automation, this is the thing that is incomplete in Sicilian territory. Also, it is missing an approach of the institutions, of local policies to invest and orient.

### Domingo Tinoco

Domingo Tinoco said that he was working as caulker during 40 years because his father was a caulker. He studied VET as lathe operator and wood. Some time ago, he was worked more because there were more wooden ships, above all, fishing fleet, currently, after the fibre, he is more focused in big ships for tourist and restoration of classics. Domingo said that it is compulsory for the wooden ships to come to the boatyard and check the wooden joints in order to not have water leaks.

About tools, some time ago, it was manual tools, but now, almost everything is mechanical, electrical tools. Domingo said that he has tools with more than 100 years old who has been owned by different generations, and mallets made of Aleppo pine or olive that you cannot find in a standard ironmongery, and other ones, but, currently, he is using those tools less frequently because ship's hull is changing to polyester.

About type of woods, one of the best is olive wood, and other ones like makore, pine, iroko depending the part of the ship, even on the desk with cherry, iroko or teak wood. He obtained teak for the desk (because it is the best for the desk in spite of really expensive) in Valencia, better than Murcia, in a sawmill that imports and exports wood around the world.

Domingo said that for being a good caulker, it is necessary the will to do hard physical efforts and work outdoors where in summer is really hot and in winter really cold. You need a lot of time to learn the different tasks of this job position, at least 5 years to be a caulker.

Domingo thinks that it is possible that shipwrights and caulkers will disappear because there are not good attitude in young people because they don't want hard works with a lot of effort, moreover, they do not have a place to learn this job position. He thinks that it is a good idea to preserve this job, because it is really nice the tasks that you are doing but it is really difficult to find apprentices.

Caulkers have a lot of different clients, like classic boats, important local businessmen, foreigners, fishermen (even they have changed into polyester)



### Salvador Tinoco - Mantenimiento Naval Tinoco

Salvador Tinoco has a wide experience as a shipwright, he learnt from his father since he was a child, beside this, he has training in 2 VET specialities, one in wood and another in electronics. Currently he is working on this but he has another job, their enterprise had several changes during their live, with some crisis due to governmental decisions or other changes. Currently, he is working as a freelancer with no excessive big jobs but some time ago, he worked in really big boats.

His tasks are, mainly, repair and maintenance of wooden ships between 5-30 metre length in interiors, cabins, hulls, decks. In decks, he usually works with teak from Burma (really expensive) and start doing a template with all the details to take into account.

According to him, to be a good shipwright, you have to like it, and being smart and with good vision to know how to do the different tasks, he feels that he has a great experience, and he has not fear to do any tasks.

He mentioned that each wood is chosen for different parts of the boat according their characteristics, they are using hard woods like ukola (for frictions parts), iroko (for the keel, stem, sternpost), oak (indoors but not in contact with water), pine, teak (decks). He has to go to Valencia to buy some of those.

### Mokol – Czesław Mowsiej

Czesław Mowsiej is a boatbuilder operating in the Supraśl commune. She is 65 years old. He is a mechanical engineer by profession. The interview deals with the activities of the boatbuilding company. It tells about the sources of knowledge and skills to build a boat, and what lies behind a well-made structure.

The interview deals with the training of boatbuilders and the possibility of practicing and the prospects of this profession. It tells the history of establishing and running your company. He talks about tools and materials used in boatbuilding, where he mainly uses laminate and wood for finishing works. It shows an individual approach to each boat project.

Summing up, Mr. Czesław believes that the profession of a boatbuilder is for people with passion and that in order to be financially fulfilled, one must have a profession. However, boatbuilders will be needed.

### Celarek

Aleksander Celarek is one of the oldest still working boatbuilders. He is 72 years old. He is a mechanic engineer by profession. He is the author of a book on the traditional Pomeranek boats characteristic of the Polish eastern coast. The interview deals with the activities of the boatbuilding company. He tells about the sources of acquiring knowledge and acquiring skills to build a boat, and as he points out, mainly from the literature of which he has a large collection, but above all during the



performance of boatbuilding. It tells about the boats made from start to finish, of which there were several dozen. The interview deals with the training of boatbuilders and the possibility of practicing and the prospects of this profession. Included interesting stories related to his company, and about boatbuilding. Interesting information about the tradition of the "traveling journeyman boatbuilder" being restored in Germany. He talks about the tools and materials used in traditional boatbuilding, where he mainly uses oak, but also larch and other species. It shows an individual approach to each boat project. Summing up, Aleksander believes that the profession of boatbuilder is for passionate people and not always financially profitable. On the other hand, boatbuilders will be needed.



## Table of courses

The table contains a list of courses that are or have been available in Europe. Information about the courses was obtained via the Internet and by direct telephone contact. Courses are conducted throughout Europe. The table includes both non-profit and commercial rates.

List of boatbuilding courses (or similar) in countries

Region / Responsibility	Countries	Title of course (faculty)	Name of provider (school or organisations)	Duration	Notes	Links
	Great Britain	Marine Engineering Levels 1, 2 and 3	Blyth Tall Ship	1 year	£ 4155	
		Leisure and Professional Course	Falmouth Marine School	1 year		
		Boatbuilding Diploma	Falmouth Marine School	1 year		
		Boatbuilding Diploma Level 2	Falmouth Marine School	1 year		
		Boat Building Apprenticeship Level 3	South Devon College	30 days		
		Apprenticeship in Marine Engineering	Southampton City College	2 years	£ 27000	
		5-day Boat Building Course	Fyne Boat Kits	5 days	£ 550	
		10 day Boat Building Course	Fyne Boat Kits	10 days	£ 1050	
		Boatbuilding	International Boatbuilding Training College	47 weeks	£ 15608	
		Woodworking & Joinery Skills	International Boatbuilding Training College	12 weeks	£ 5950	
		Build Your Own Boat	International Boatbuilding Training College	12 weeks	£ 8286	
		Bench Joinery C&G				
		Training course title Short Courses: <i>Small Boat Building</i>	International Boatbuilding Training College	2-4.5 days		
	Ireland	Boatbuilding (Small Wooden Craft)	CAVAN INSTITUTE	1 year		
		Boatbuilding Diploma Level 2	Falmouth Marine School	1 year		
		Boatbuilding Diploma Level 3	Falmouth Marine School	1 year		
	France	Hull Artificer	National Maritime College of Ireland	3 years		
		Bac Pro Nautical Maintenance (Bac Pro Maintenance Nautique)	Lycée polyvalent de la mer; Gujan-Mestras	2 years		
	Greece	CQP CARPENTER OF NAUTICAL FITTINGS (CQP MENUISIER D'AGENCEMENT NAUTIQUE)	Compagnons du Devoir et du Tour de France	11 weeks		
		Technician of Marine Engines and Pleasure Boats	Public and Private IEX	5 semesters (4 + 1 semester of internship or apprenticeship) 3000 h		
		Turkey				
		Albania				
		Bulgaria				
	Belgium	Cabinet maker / (ship) interior builder	Hout- et Meubelings College	2 years		
		Enterprising furniture maker / (ship) interior builder	Hout- et Meubelings College	4 years		
		Work planner furniture industry / (ship) interior builder	Hout- et Meubelings College	3 years		
		Work planner furniture industry / (ship) interior builder (instantaneous water heaters)	Hout- et Meubelings College	1-2 years		
		Level 2 - Ship interior builder	HMC vocational school for wood, furniture and	4 years		
	Netherlands	BBL / 4 (Work planner furniture industry/ship)	ROC Midden Nederland	2-3 years / <i>Accoluto during</i>		
	Italy	Allievo Maestro D'Ascia del diporto	Ismef - Istituto Mediterraneo di Formazione	500 hours - 5 months		
		BACHELOR IN NAVAL ARCHITECTURE AND MARINE ENGINEERING	Università degli studi di Trieste	3 years		
		"Costruttore Navale"	Istituto Nautico Gioeni Trabia (Palermo) and also in all Nautical school in Italy	1056 hours each year, 5		
		THE DESIGN OF THE HULL SHAPE THROUGH THE HALF MODEL	"Storie di barche" Association			
		INGEGNERIA NAUTICA	Università di Genova	1545 hours - 3		
	Poland	Plastic mold worker in the boatbuilding industry	Wamiński-Maruski Zakład Doskonalenia Zawodowego w Olsztynie Wamian-Maurian Vocational Training Institution	60 hours		
		Shipwright - Carpenter	EVENEA	30 hours		
		Shipwright - laminator	District Job Centre - Vocational Activation Center Węgorzewo Poland	250 hours - 2 months		
		Yacht and boat monitor (shipwright)	Vocational and Lifelong Learning Center No. 1 Gdańsk	3 years		



## Definitions of shipwright

### Shipwright

A shipwright builds and repairs boats and ships of all sizes, from handmade canoes and small boats to large naval vessels. Shipwrights design and build ships according to the specifications of individuals or companies. Depending on the size of the ship, shipwrights may use hand and power tools to construct the boat themselves, or they may oversee a team of shipbuilders.

Definition	Tasks
<b>Education Required</b>	A degree from a maritime shipbuilding program or a lengthy apprenticeship is required to become a shipwright. Shipwright apprenticeships may last for several years to ensure that shipwrights learn all of the practical and creative aspects of shipbuilding. Maritime schools offer shipwright programs that vary in length and include classes in woodworking, lofting, and skiff construction.
<b>Skills Required</b>	Shipwrights must be highly creative and have knowledge of construction, physics, engineering, and math. Organizational skills and the ability to manage employees also are important for shipwrights. They must have communication skills to provide clear, concise instructions to engineers or other professionals, as well as highly developed team working skills.
<b>Knowledge and skills</b>	Knowledge and skills in the field of occupational health and safety and issues related to running a business is also an important element of training in the shipwright profession





## Proposed issues of course

Based on this required education program should contently following issues concerning strict knowledge and skills in the field of boat building.

Basic information	Advanced course content		
	Boat building	Boat repair	Composite boat
1. Historical outline 2. The specificity of individual sea basins - depths, salinity, water temperature, etc. 3. The art of building boats and ships 4. Examples of boat construction solutions typical of maritime regions, historical and contemporary 5. Dictionary - basic names in the following languages: English, Spanish, Italian, Greek, Polish 6. Construction examples, drawings 7. Sailboat as utility boats 8. Boat service - Maintenance in the water (hot sun, warm winter) - Winter time maintenance (condition of storage)	Tools Materials use in traditional boat building 1. Wood for boatbuilding - essence of knowledge - wood species and properties (description and tables) Wood-based material 2. Screws and nails - corrosion and nail problems 3. Paints and varnish 4. Glue 5. Process	1. "Scraping down to bare wood" 2. frame repair, 3. planks repair, 4. coating repair	1. Materials 2. Process
	1. Joints 2. Bending 3. Wood frame 4. Floors 5. Planking - types 6. Deck 7. Backbone 8. Spinning 9. Surface treatment 10. Mounting Hardware		



## Profile the Shipwright student

Skills constituting a basis for education in professions

Student:

- Selects ways of transporting and storing materials.
- Defines the construction and observes the rules of machines and devices.
- Uses the technical documentation of machines and devices and follows the standards of technical drawing, machine parts, construction and operating materials
- Observes the rules of preparing technical drawings of machines and equipment.
- Follows the rules of tolerance and fit.
- Recognizes types of corrosion and determines the ways of protection against it.
- Distinguishes between machine and equipment parts.
- Distinguishes between machines, devices and tools for manual and machine processing.
- Distinguishes between construction and operating materials.
- Distinguishes between methods of quality control of the work.
- Distinguishes between measuring instruments used in manual and machine processing.
- Student distinguishes between types of joints.
- Distinguishes between the means of internal transport.
- Distinguishes techniques and methods of manufacturing machine and equipment parts.

Starting and running a business

Student:

- Analyses the activities carried out by companies operating in the industry.
- Initiates joint ventures with different companies in the industry.
- Operates office equipment and uses computer programs to support business operations.
- Optimizes costs and revenues of his business activity.
- Plans and undertakes marketing activities of his business activity.
- Conducts correspondence connected with running a business activity.
- Prepares documentation necessary to start and conduct business activity.
- Distinguishes enterprises and institutions occurring in the industry and connections between them.
- Applies concepts from the area of market economy functioning.
- Applies legal regulations concerning conducting business activity.
- Applies the provisions of labour law, legal regulations concerning personal data protection and tax and copyright law.



## Skills underpinning vocational training

### Student:

- Selects the methods of shaping the surface according to the documentation.
- Identifies materials for boats and yachts.
- Identifies auxiliary materials used in the manufacture of boats and yachts.
- Identifies the properties of materials used in boatbuilding.
- Uses the instructions of machines and equipment used in boatbuilding.
- Prepares elements for painting.
- Identifies the elements of boats and yachts.
- Recognizes tools, equipment and machines for wood and plastic processing.
- Recognizes defects in wood and plastic in boatbuilding.
- Recognizes the types of boats and yachts.
- Makes sketches and technical drawings.
- Uses computer programs to support tasks.
- Takes measurements of elements and structures of boats and yachts.

## Results and discussion

1. The topic presented is extensive, and depending on the course, it should be reduced. People are disappointed with the substantive message of the course.
2. According to the opinion, potential students would expect a practical approach to the conducted classes. If you try to maintain the tradition of boatbuilding courses, potential students expect practical classes within the subject. A practical approach is the most important and leads to the proper assimilation of knowledge in this field.
3. It is worth noting that the profitability of the profession is important to keep this profession on the market. To maintain this tradition, financial support from the state is needed, such as grants, reliefs, tax exemptions.
4. In countries where marine tradition is cultivated and preserved, there are more courses and people involved in boatbuilding (Anglo-Saxon and Scandinavian countries and the Mediterranean).
5. Causes of low education in the Baltic Sea regions (Poland, Finland, Lithuania, Latvia)
  - Extinction of tradition (former USSR country) – discrimination,
  - Citizen populations in the Baltic countries (traditions revive in some regions),
  - For a period of 40 years in Poland, boatbuilders were not trained (therefore the tradition has remained residual),
  - In Lithuania and Latvia, such courses are not organized at all due to lack of interest,
  - Period of use of the boat (seasonality),
  - People can't afford boats,
    - Boatbuilding is considered a hobby.



## Conclusions

The following assumptions should be considered when preparing the course about seasonality, techniques, staff and the possibility of selling boatbuilding services and products.

### Seasonality<sup>1</sup>

- seasonal activity of traditional boatbuilding.
- waiting for orders for weeks, months (Celarek - Poland)
- a small activity alternative to maintain jobs in the "dead - no orders" period

### Techniques<sup>2</sup>

- traditional techniques are used less and less (laborious and time-consuming)
- Greater use of power tools that emit more waste and dust (need to use personal protection).
- The use of newer, cheaper, faster technologies of making boats based on laminates (it is replacing traditional wooden boatbuilding).
- Due to economic reasons, a large amount of work and long lead times for making traditional boats become individual and unprofitable.
- Individualisation (customization) leads to the lack of use of traditional patterns and templates.
- The implementation of the design for individual recipients in traditional shipyards, taking into account the traditional way, is not easy.
- Limited resource base.
- Wood intended for the construction of boats requires specialized sawing and processing, no such base (f.e. Poland)
- The wood used for construction is insufficient compared to plastics, in particular due to the high price of exotic wood - certified sources

### Staff

Difficulties in finding employees due to:

- Seasonality of boatbuilding works (preferably employment - "full-time" all year round).
- Losing competition in seaside towns with the tourist, catering and hotel industry due to "easier and better-paid work"
- work for enthusiasts

---

<sup>1</sup> Required support in the form of, for example, municipal orders, subsidies, grants, tax exemptions

<sup>2</sup> During the traditional boatbuilding, the shavings are essentially harmless.



The possibility of selling boatbuilding services and products

- A market for a wealthy client
- Little demand for the fisheries sector
- A price barrier even for the middle class
- Fashion for boats requiring minimal service in and out of season