



# PILOT PLATFORM OF VOCATIONAL EXCELLENCE – WATER

## Impact evaluation

Analysis of the Baseline  
Questionnaires

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## Impact evaluation revisions

Revision	Date	Author	Status	Description
V01	31.3.2021	CREA	Uploaded	First draft of impact evaluation

# Analysis of the baseline questionnaires

## Participants in the questionnaires

### Students Questionnaire of Vocational Excellence and Training: **85**

<i>Czech: 15</i>	<i>9 students filled the Czech version</i>
<i>Malta: 12</i>	
<i>The Netherlands: 11</i>	
<i>Latvia: 24</i>	
<i>United Kingdom: 23</i>	

### Triple helix Questionnaire of Vocational Excellence and Training: **56**

<i>Czech: 11</i>	<i>11 participants filled in the Czech version</i>
<i>Malta: 14</i>	
<i>The Netherlands: 9</i>	
<i>Latvia: 10</i>	
<i>United Kingdom: 12</i>	

### Teachers Questionnaire of Vocational Excellence and Training: **44**

<i>Czech: 8</i>	<i>8 teachers filled in the Czech version</i>
<i>Malta: 16</i>	
<i>The Netherlands: 10</i>	
<i>Latvia: 8</i>	
<i>United Kingdom: 2</i>	

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## Aggregated results

Analysis has been conducted on Survey\_monkey. Regional captains were responsible for ensuring 10 participants from each stakeholder category in the given region. In the student category all regions fulfilled their obligation. In the category triple helix was missing one participant. In the category teachers, three regions - Czechia, Latvia, and the United Kingdom missed the target of ten participants. This was actually a surprisingly bad result, since teachers were supposed to be among the important group to profit immediately directly from the project result.

There is a particularity in the Czech Republic, questionnaires for all the stakeholder groups had to be translated into Czech language to enable adequate number of participants. The inadequate knowledge of English language amongst the Czech participants is an obstacle, but it can also be seen as an opportunity for future projects to work parallelly on the language competences. Communication with teachers and students from a selected VET school in Brno - Czech Republic showed that they knew their limitations and were eager and grateful to be able to join the project activities to improve their language skills.

### 1) Teachers and VET school management

#### Subcategories

Next category of stakeholders was representatives from VET schools - teachers, management.

Out of 44 respondents:

- 1. 57% were teachers**
- 2. 9% managers**
- 3. 20% represented both**
- 4. 14% others**

The years of experience in the field varied from 0 to 40. The biggest group were respondents with 0 to 5 years of experience (21), 6 - 10 years (10), more than 11 years of experience were having 13 respondents.

Respondents were representing different types of schools:

- 1. Secondary education - 5%**
- 2. VET - 55%**
- 3. Higher education - 14%**
- 4. Including all or at least 2 subcategories - 27%**

There were schools of different sizes represented. We were asking the number of students: in VET basic training this varied from 30 to 12 000, among adult education reskilling (same level, different topic) from 10 to 4 200, in the group adult education upskilling (higher level, same topic) - 6 – 4 000 students.

### **Innovative potential of the VET schools**

59% respondents agreed that they form a VET school that is “at the forefront of technological developments and/or research in the water sector.”

18% disagreed with the previous statement.

Only 43% found relevant or highly relevant following formulation: “My VET school plays an important part of the water innovations structures and strategies in the water industry in the region”.

36% as slightly relevant or not relevant at all.

The question of cooperation of VET school, whether the VET school promotes synergies, cooperation and cross-fertilization with other water industry stakeholders answered 66% with agreement and only 9% disagreed.

68% approve that cooperation with water sector stakeholders has important influence on VET curriculum updates in their institutions.

### **Cooperation with other stakeholders**

Relevance of the education--business relationship at VET school was valued by 59% as relevant or highly relevant, by 27% as moderately relevant, around 12% saw the relationship as slightly relevant or not relevant at all.

Respondents were also asked whether there is an exchange of staff and teachers between companies and VET. 18% specified that there has never been similar exchange, 16% said that it happens very rarely and 23% stated rarely. 32% mentioned that exchanges happen occasionally and 11% stated that they happen often.

When we asked directly whether they take part in exchanges there were following answers:

36% never, 18% very rarely, 16% rarel, 25% occasionally, 5% often.

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More positive answers came to the statement “On my institution students execute their assignments with companies”:

7% never, 9% very rarely, 16% rarely, 41% occasionally, 27% often.

### **Student skills**

Representatives from the schools were asked to assess students’ skills and competences.

Teachers and school management were asked whether students are agile - 48% agreed, 43% was undecided.

To the question about flexibility of the students - 79% answered positively and undecided was just 14%.

In the assessment of students' creativity - 45% agreed that students are creative, 9% opposed that they do not see creativity among students. There may not be enough opportunities for students to show the creativity we cannot derive though the real reasons for the questionnaire; this would require more thorough analysis.

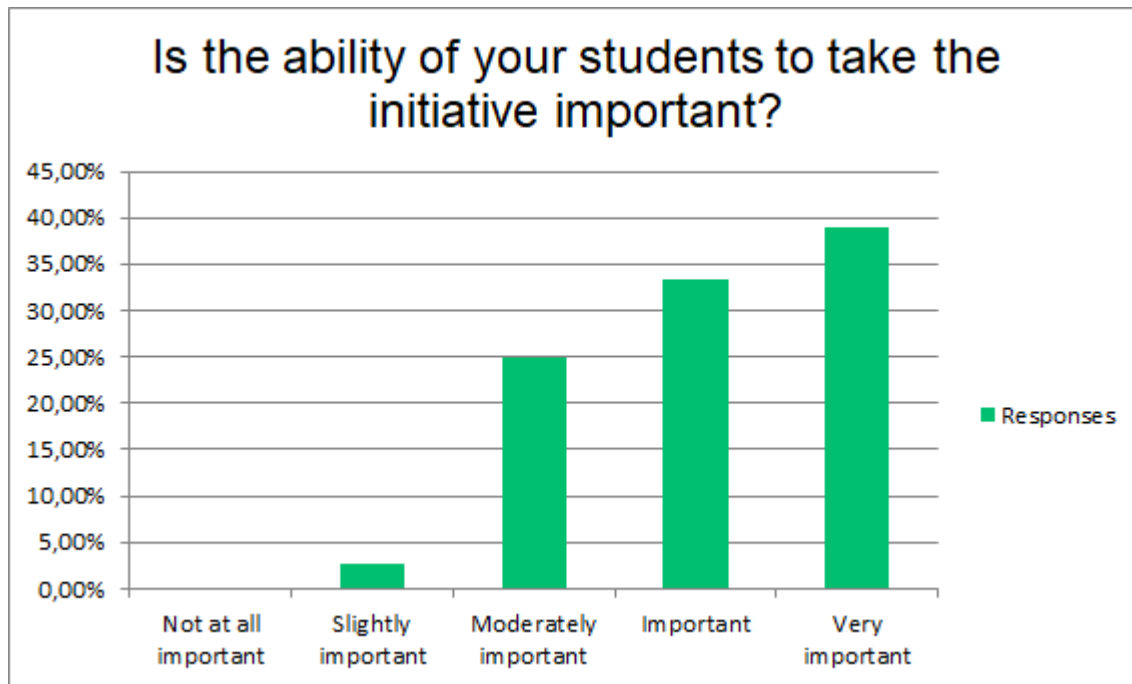
Teachers and managers notified that their schools support learning through experience - 82% represented this opinion.

70% stated that students have good work attitude, undecided was quarter of the respondents.

Further the questions about student entrepreneurship competencies were:

48% agreed upon, nonetheless 14% disagreed and 38% was undecided. This particular competence should be more supported in the curricula.

Better results though showed the question: „Is the ability of your students to take the initiative important?“ As very important and important valued the ability of students to take initiative 72% of respondents.



Digital skills of students were valued as good or very good by 68% and 30% valued their digital skills as fair. Digitalisation is common and for students nowadays very natural.

### **Internationalisation**

International connections of their institution valued:

17% as very good, 42% as good, 19% as fair, 11% as poor, 8% as very poor.

Internationalisation will stay as an important topic for the coming years. Teachers as well as students need to acquire knowledge outside their region to become agile experts in their fields. Problematic in some regions, eg. Czechia are language competences of the teachers, managers and students.

## 2) Students

### Subcategories

Category of students was best represented in the baseline questionnaire. 85 answers from VET students. There were three subcategories of students that we have distinguished in the survey to enable us to analyse their answers more precisely.

- 1. Students in initial training -- 66 students (78%)**
- 2. Professional in continuous reskilling education -- 3 students (4%)**
- 3. Professional in continuous upskilling education -- 16 students (19%)**

The biggest student groups were from Latvia (24) and the United Kingdom (23) followed by the group from the Czech Republic (15). In the survey students had to answer their experience in the sector given by the number of years they have been following water related education.

The answers varied from 0 to 10 years, where the majority have been in the two groups we call for simplification as beginners 40% (1 year of education) and intermediate 45% (2 to 3 years of education). 9% were in the category advanced (4-5 years of education in the sector) and 4% were among professionals with more than 5 years of education in the water sector. 2 respondents were without experience in water education.

### Innovative potential of the VET schools

Students were asked to value the innovation potential of their VET school on a point scale (from strongly disagree (1) to strongly agree(5)): "My VET school is at the forefront of research and technological developments in the water sector."

Weighted average for this question was 3,55, there were 44% to agree with the statement nevertheless we need to stress here that 37% of respondents were undecided which changes the statistics significantly.

To ensure control of the responses some connected questions were used in another part of the questionnaire. One such question was directed at the knowledge of the students about the network of the school to be part of innovation in the industry:

"My VET school is part of the water innovations partnerships in the water industry in the region". Not surprisingly were answers bit different to the previous more general question. The weighted average showed a score of 2,69 points. There were 45% of undecided respondents; on the other hand 24% valued the connections of the school concerning innovation as very good and 27 % as good, which makes more than half respondents to be persuaded of good innovation partnerships of their VET school.

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Students were also asked to give their opinion whether taking initiative is important at their VET school. Over 90% were stating that taking initiative has an importance in their VET school. Even more students (around 95 %) are representing the opinion that learning by experience is relevant at their institution.

### **Innovative potential of individual students**

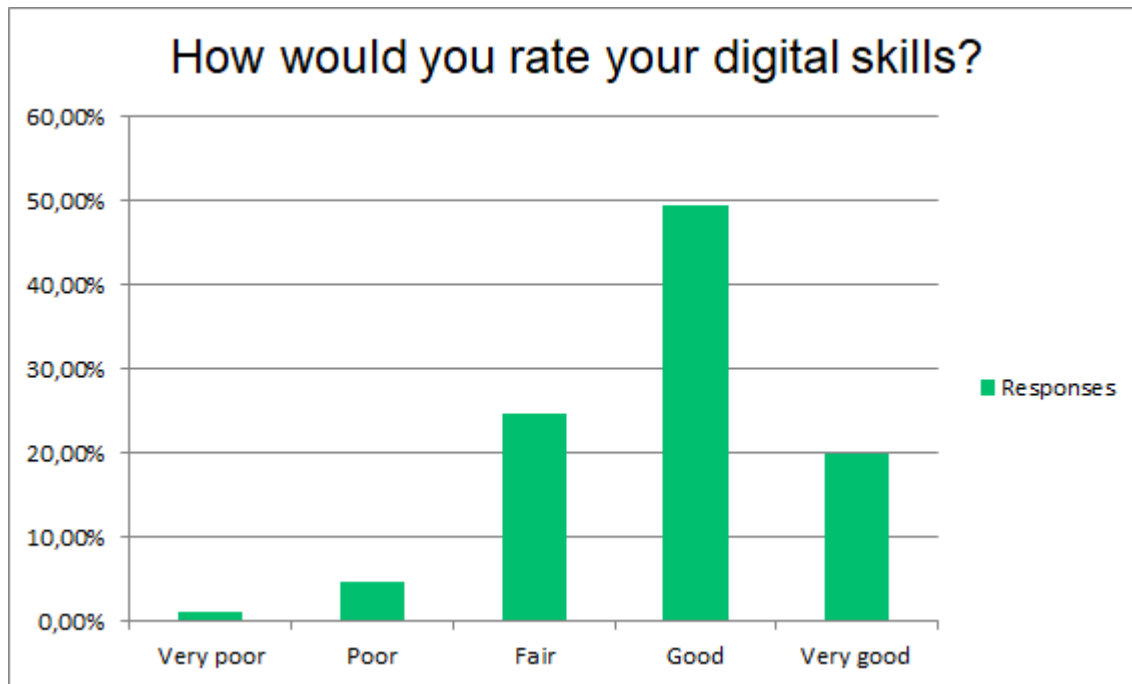
For individual students it is not so important whether the school is at the forefront of research, but how he can personally acquire the knowledge and use it for his career. We let students access their competence from different angles. In the connection to a question about innovative potential of their VET school we have asked to assess whether, "they are currently on top of the technological developments in the water industry".

There was a very significant group of 34% that disagreed with the statement and 6% that even strongly disagreed. A little more than a third was undecided and just around one quarter agreed with the statement. This is a crucial finding as our project aims to educate future professionals confident in theoretical knowledge. Students are though aware of the school's positive influence on their innovative potential. Thus answers on the following question: "My VET school improved my capacity to be innovative in the water industry" were in favour of the VET schools potential. 50% of respondents agreed with the statement and another 19% strongly agreed.

Students were further asked to evaluate their creativity, entrepreneurship qualities and flexibility. With the sentence "I would describe myself as creative." agreed and strongly agreed more than 80%, which is really promising. Nearly 60% of students see themselves as entrepreneurs and 78% believe they are ready to possess enough flexibility to be able to cope with changing conditions.

### **Digital skills**

Personal rating of state of own digital skills showed as expected for the young generation positive results. Majority of the students see their skill as at least fair and nearly 50% as good, 20% even as very good.



When we asked students whether online tools are an important part of their education the results are slightly different. There was a surprisingly high percentage of students valuing use of online tools as very relevant (42%) and 28% sees online tools as relevant. 12% were indicating that use of online tools is just slightly relevant or irrelevant at their VET school.

### **Recognition of the water expert job**

An important point in the motivation for education in water resources management is definitely recognition of jobs in the water industry. Students were asked whether they are proud to be (future) water experts. 72% agreed or strongly agreed with the statement, 26% was undecided and only 2% disagreed.

### **Skills for sustainability**

Important skills for current students are competencies in sustainable approach. 85% of students stated that acquiring "green skills" belongs to their VET education.

### **Connection to practice**

Connection to companies and real life experience is crucial for future water experts. Two areas were covered by the survey. Learning through experience and cooperating with companies. Concerning experience learning students were asked whether they get real-life experience and how relevant is this kind of learning at their VET school. 23% of respondents named that they are in contact with real-life experience never or very rarely and next 12 % rarely. Only 5% can enjoy experience learning often, the rest of the students occasionally.

This is in contrast with the answer to the question whether “learning through experience is relevant at their institution”, where 80% stated it is relevant or highly relevant. We are not sure how this discrepancy can be explained. Slightly relevant or irrelevant was shown in 6% of cases (so in half of the cases in comparison to differently asked the same question).

Project aims to promote cooperation among different stakeholders and concentrates on the connection to business. To evaluate how strong the connection to companies is students were asked whether they execute assignments with companies.

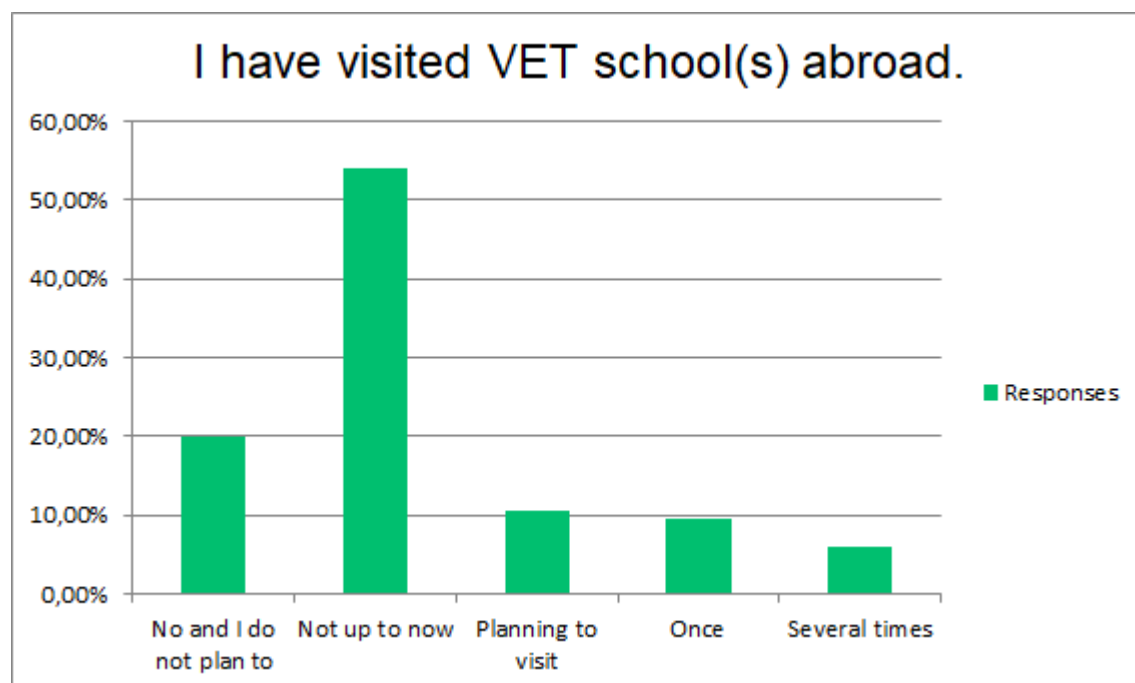
67% answered NO to this question. There is definitely big scope for improvement in this field.

### Internationalization of water education at VET schools

International dimension is becoming to grow in importance in every region, nevertheless VET schools act usually locally and are lacking far behind higher education in this field.

74% of the students experienced foreign lecturers at school never, very rarely or rarely, just about 5% had the chance to listen to foreign lecturers often.

Interestingly, a small number of students have visited VET schools abroad and many students do not even consider going for such experience.



### 3) Triple Helix

Representatives of triple helix that participated in the questionnaire were having experience varying from newcomers to professionals working in the field more than 20 years.

**26% respondents with 20 and more years of experience.**

**26% with 10 to 19 years of experience.**

**21% between 5 and 9 years.**

In the triple helix group, three subgroups were represented :

- higher education (16%)
- industry (46%)
- governmental stakeholders (38%)

#### **Assessment of VET schools in the region**

Triple helix participants were asked to assess VET schools in the region. To start with let us state that later in the questionnaire there was a control question, which we would like to present here as first. As this particular question very clearly shows that the cooperation between VET schools and triple helix stakeholders need a new strategy for the future.

70% answered with no to the question whether they have an overview of the curricula of VET schools in the water industry sector. This corresponds with the results of the question on contact with VET schools education future water professionals - 64% has never, rarely or very rarely made contact with VET schools.

Following statement was given to triple helix respondents for their evaluation "In my opinion curricula of VET schools in my region are adjusted to educate current and future water sector specialists". One third agreed with the statement, one third was undecided and one third disagreed.

Further participants valued whether the VET schools in the region are on top of the development in the water industry. Just 22% agreed with the statement and one half was undecided, again showing the lack of cooperation between these two stakeholder groups.

Slightly different angle was evaluated with the statement "VET schools in the region have a good knowledge of emerging labour market needs in the water sector." To assess the validity of this statement required a fair knowledge of the sector and labour market thus 55% answered that they do not know. 20% disagreed with the statement and 25% agreed with it.

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The reader must bear in mind though that the triple helix representatives have limited contact with VET school students. 73% of respondents stated that they do not have regular contact with VET students.

This is also one of the objectives of the consortium that applied for the pilot project for excellence centre in vocational education to work intensively on triple helix and VET schools cooperation

Triple helix respondents understand very well the importance of the cooperation, which was nicely shown with their reaction to the statement "How would you rate the relevance of the education--business relationship in your region?" 25% saw it as moderately relevant and around 64% were persuaded that it is relevant or highly relevant in their region.

### **Assessment of students from VET schools**

The number of respondents for questions concerning students was limited, 42 participants skipped the questions as unable to answer them. There were only 14 participants with direct contact to students that evaluated students' skills.

72% of the respondents agreed that current VET students will become value water sector experts in the future. 58% believe that students have capacity to innovate, although only 21% believe in entrepreneurship competencies and self-awareness and just 36% see students as creative.

70% agree that VET students acquire "green skills" during their study.

In spite of the fact that the number of the answers concerning students was quite limited, the information gathered in the questionnaire can be used in further development of the curricula at VET schools.

### **Assessment of alumni from VET schools**

Triple helix respondents have experience with VET school students and alumni. To prepare students to be able to become a valuable water expert is a crucial point for the whole cooperation.

With the statement "The majority of VET alumni is flexible and adaptable to the innovations of the sector." Agreed one third of the respondents, more than half was undecided, but as a positive result we take that no one had strongly disagreed and just 13% disagreed.

### **Innovative potential of Triple helix stakeholders**

Triple helix participants were answering, where their institution stays concerning the technological development in the water industry. 60% agreed that "their institution/company is at the forefront of technological developments or research in the water sector." 18% disagreed with the given statement.

Further respondents were asked to assess whether “their institution/company plays an important part in the water innovations structures and strategies in the water industry in the country/region.” 66% were sure that their institution plays an important role in innovation structure; around 16 % were representing the opinion that their institutions do not play an important role in innovations.

Very important for the future development of the network of different stakeholders is to understand who is taking the active role in the relationship. Triple helix respondents were asked to evaluate the following statement “My institution/company promotes synergies, cooperation and cross-fertilization with other VET schools and other water industry stakeholders.” One quarter was undecided, 11% disagreed and 62% agreed that their institutions promote cooperation among different stakeholders in the water industry.

The questionnaire also covered evaluation of networking among triple helix partners. 88% answered that they are in contact with other stakeholders from the water industry at least occasionally.

### **International connections of Triple helix stakeholders**

68% of respondents rate international connections of their institution as relevant or highly relevant. There were also stakeholders with no or very insignificant international connections around 16 %.

## Individual suggestions from participants

Participants from all groups were asked an open question to assess future development of the sector/their career. We have selected interesting answers for the analysis.

### 1) Teachers and VET school managers

#### How do I see VET education in the water sector in 5 years?

- Progressive and modular, to be flexible for labour market.
- Improving and hopefully there will be support from water sector companies.
- Longer and more intense internships at water institutes with the possibility of financing thesis projects + internship with foreign institutes + student exchanges.
- The strong collaboration with industry could provide a way and means to generate target oriented students, ready for the job as qualified analysts and microbiologists. Apart from that the increasing strong collaboration could generate topics of research to tackle issues which were never studied before, enabling the acquisition of funding projects whereby both the institute and the industry could benefit.
- Next year there will be ready a new modular VET program "Technician of environment equipment". Hopefully for young people there will be more interest in this profession. Our school works with international partners where students (23-31 day) and teachers (7-10 days) are going abroad to improve their professional skills and knowledge.
- I see VET education in the water sector in 5 years as a progressive and developing. I hope that in these 5 years we will have more exchange programs for our students and teachers in other EU countries. Relationship with major stakeholders also is very important. I think that in the near future a very strong turnover will pick up technical tools - online lessons, virtual laboratories, which will be increasingly used in everyday activities - lessons, laboratory works etc.
- Given the current situation with the Covid-19 pandemic, we have been forced into online contact with students. Looking to the next academic term, this will continue at least for a few months, and this will have the effect of accelerating the move to online learning for part of the course. This will change the nature of the course, but also mean that my institution has to change course material to suit, and these changes will need to be made on a more regular basis to keep pace with technological advances in the sector. Field trips and site visits will still be required as I feel this is an important and indispensable part of our course that cannot be replaced by online

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experience. This may also mean that I, as a lecturer, have to become even more flexible, as students, all of who work full time with water companies can see that online learning and training allows them more flexibility. Lectures may be done predominantly via webinars, assessments will be done online and all of us will require becoming more familiar with platforms such as Miro, Mentimeter, Zoom, MS Teams, Google Hangout etc. This may mean that contact across business departments, companies and internationally becomes easier, more effective and efficient, cheaper and as such technologies, training and thinking can more readily be exchanged. All in all, a very good thing for the industry.

- We need a leader in this field and someone who has an interest and the freedom to push this topic forward in our institution.
- VET Education in the water sector will develop a broader base with subjects not yet identified, represented in the curriculum as technologies develop.
- It will be very important but we are not including certain sectors due to the social perceptions to water reuse and lack of industrial standards.

## 2) Students

### **How do you see yourself as a water industry expert in five years?**

- I hope to become a process scientist working in either waste water or drinking water. This course along with further education should allow me to progress to that level.
- A valuable asset to the water industry.
- Still working on the network within Scottish Water, whilst still enhancing my learning about the water industry.
- Starting from the bottom, gaining experience and learning new things to help me progress into a different role.
- I see myself with a broad base of knowledge regarding the water industry and hopefully entering a specialized area of it, whilst continuing professional development and improving qualifications.
- I see myself moving around in the water industry to further my knowledge on how it works and how it can be innovated.
- I see myself as a fully qualified water treatment operator with a good knowledge on the water treatment process.
- I am to gain as much knowledge on the industry as possible in order to forward my career in the water industry.
- Going for my bachelor in water. After that travel the world while working in the water industry.



- I am probably going to study civil engineering. So that'll decrease the chance to be a water industry expert in five years.
- I do see myself as an expert in some topics unrelated to those I am currently studying and my future likelihood of becoming an expert in the topics I am studying will depend on opportunities available within Scottish Water going forward.
- I actually don't see myself as water industry expert, but the profession is good and needed in life.
- Well, my dream is to study or work abroad, and this would be a great chance to see if i would like to work this kind of job in the future, and if i will enjoy my work then in the future i am sure that i will dedicate myself to this kind of research and industry type..
- I would see myself working at "Rīgas ūdens", which is the biggest supplier of clean water in my country. I would expand my knowledge not only in the drinking water sector, but also in sectors like wastewater recycling.
- My plan is to continue higher education in the field of chemistry and biology, which is closely tied to the water industry. In the future I plan on experiencing different labs and then decide the best one for me.
- Leading a team within Scottish water.
- I am currently working at the authority for the environment and I plan on doing so for the long run. whether i have an opportunity to become a water expert in the future is undetermined.
- After graduation I have a plan to study at the Latvia University of Life Sciences and Technologies and hopefully I could work a little bit in the water sector where I do now my qualification before graduation.
- Well, I really don't know. I am studying second year and till this last (4.th) semester I didn't have any subject studying water and water industry so I can't tell you much about my future career as a water industry expert or if I even became one someday. And this semester was heavily affected by coronavirus, so I can't really make my opinion. But I am interested in it.
- i would like to be an expert contributing to something really useful to my country and preferably to the rest of the world too.
- I have the ambition to be a competent expert at managerial scale.
- As a skilled worker tackling problems and coming up with solutions to water pollution.

### 3) Triple Helix

#### How do you see development in water sector VET education in your region in 5 years?

- More practical examples in curriculum, better link with research and industry.
- More in dialogue with business practice, more focused on sustainability and self-reliance / self-learning of students. Communication skills are becoming more important.
- I would like to see more VET education in the water sector- due to location in North Scotland; there are less options and breadth of resources compared to central locations.
- Educated in the newest technology and highly skilled.
- I would say that we need to start the education of water, waste and the environment in primary schools and throughout high school to help young people understand the importance of water as a precious resource.
- This needs to be at the forefront of the water sector. It must be prioritised. I foresee a more virtual world and the education sector will have to meet these changes and the challenges that will bring. However, there are opportunities to teach larger numbers at a more efficient scale with this approach. There needs to be more international relationships in order to achieve water sector excellence.
- More case related education. So more cases from the industry to be solved by students in order to make them more feasible for the sector.
- A dialogue needs to continue between the water sector (the public water/wastewater utility, other public agencies working in the water sector, and the few private companies who are working in the sector) to understand the educational and training needs of personnel within the sector. I feel VET Education could also be a catalyst for improvement within the water sector to provide continuous development education opportunities. This can be done through understanding the educational needs of the various water players and then design different courses to meet these needs, as well as propose innovative courses in which VET education may drive innovation in the water sector.
- Specialised conservation and eco-hydrology courses aimed at the reinstatement of good ecological status of natural water bodies, sustainable use and management of water resources whether coastal, surface or groundwater.
- I would say rather than limiting it to VET schools, it should be widespread - catch them young - to raise awareness on its threatened state. I'm sure there are multiple initiatives which I'm not aware of, but a campaign such the Catch the Drop (which has both gov and private stakeholders) and WATER –

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BE THE CHANGE could do wonders. It's about taking a thematic approach to education - you could mention water in multiple topics at multiple times in a child's life to reinforce the attitude or behavior that you want. And there are so many other issues - everyone is competing to be heard the most rather than working together- which I think will ultimately affect the efficiency of the messages you want to pass on to students.

- The availability of trained professionals will greatly enhance the knowledge of the future workforce to the emerging problems in the water sector.
- An increase would develop in the next 5 years. We would hopefully learn more to appreciate this resource, even more when we are an island, relying solely on the R.O and rain water.
- It is hoped that the curriculum will rise to the challenge of innovation against the background of increasingly felt pressures of climate change.
- Education and industry develop the young professionals together in a hybrid environment.
- I work at the Public Abattoir within the Ministry for Sustainable Development, Environment and Climate Change. It is planned that over the next year we will invest in a new Reverse osmosis and installation of new water systems. However more training is needed to be provided to the maintenance team. Unfortunately, courses related to VET education are still lacking or if available not provided by the Ministry.
- The methodology and training programs should be evaluated and adapted to the current market situation.
- Stakeholders will be consolidated which will promote VET education development.
- Education in our region was not in the water sector.
- It definitely needs to be adapted to meet current and future demands from a technical and technological standpoint.
- Focus on collaboration across Europe (especially with Brexit) and internationally. Also need to focus on the speed of innovation and working across different industries and sectors.
- There will be high needs for VET education.
- We are in the aquaculture sector which is not specifically the water sector but there is overlap. In the aquaculture sector VET development is highly important, especially in developing countries where the sector is expected to develop quickly in the coming years. Therefore curriculum should be developed and adopted to the local circumstances.
- Whilst not directly responsible for the delivery of VET, CREW does support, and has an interest in, the development of vocation education so Scotland

maintains its position as a Hydro Nation and leader in research and innovation in water regulation and industry. Key areas:

- International delivery of the SDGs particularly SDG 6 and wider water policy;
- Development of targeted courses focusing on water law, policy and science interface;
- Innovation:
  - Reducing domestic/industrial water consumption (including carbon/energy/financial efficiencies);
  - Water and waste water reuse from a circular economy perspective (blue, green, grey and black water);
  - Green recovery (lesson learnt from Covid-19 pandemic);
  - Links to the climate crisis (Water scarcity; Flooding Risk Management integration of engineering/environmental courses).