

*Fostering Growth in the Blue Economy by developing
an action plan for innovative European aquaculture
VET and harmonized qualifications*

D5.2 European aquaculture VET, identification of VET best practice

WP 5 - VET supply analysis

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Summary

In all 12 countries the aquaculture VET schools are small organizations. They will employ just a few aquaculture teachers. The largest one, IGafa in Spain, employs 12 aquaculture teachers. Many schools have less than 4-5 aquaculture VET teachers.

In 10 countries, except for Norway and Scotland, the number of employees in the farming industry are relatively low. They are in addition spread out in large rural areas in the coastal zones. This makes it challenging to set up a sustainable aquaculture VET system without making up a partnership between the regulating bodies, the potential organizations that may offer aquaculture VET and the farming companies itself.

The companies in Norway and at Iceland highlight how importance work-based learning is and consider 6 months to be an absolute minimum to get relevant practice. The training periods must be so long that students may take part in an operation out at the farms several times. That is the only way to learn sophisticated operations. The format of the training must reflect that both industry and the training bodies are operating in rural areas where islands, mountains, fjords and mountains may create challenges, whereby mixtures of blended learning delivery formats combining on-site training in class rooms, e-learning to offer improved flexibility and synchronous based video training to handle the geographical challenges, are appropriate.

Based on the findings made in BlueEDU, Norway and Scotland are considered the countries that have developed the most professional aquaculture VET systems in Europe. However, this report shows that it is a big difference between how the vocational education and training is organized in Norway and Scotland, despite both countries have an NQ in Aquaculture. Norway's NQ is considered to be the most comprehensive at level EQF 4, while the Scottish one is at level EQF 3.

Norway VET supply:

1. Description of the Norwegian educational system, including the Vocational Education and Training (VET) system.

National policy

Mission

The VET system, including apprenticeships, is an integral part of the Norwegian education system. The government views VET as a central means for achieving national goals in areas such as economic, regional and employment/labour market policies. Education and training including VET are considered a public responsibility. VET is available all over the state so as to ensure an equal education for all. Equal access to high quality education is a fundamental political principle. There are no school fees at any level including higher education in the public education system. Only a small share of pupils and students attend private education.

Strategy

Reform is an ongoing process associated to VET national policy in Norway, for instance, a comprehensive curriculum reform was introduced in 2006 so-called "The Knowledge Promotion Reform" ("Kunnskapsløftet"). New national curricula were developed for each subject in both school-based and apprenticeship-based education and training. The Norwegian Directorate for Education and Training ("Utdanningsdirektoratet") managed this process through a broad and open process. Each Subject Curriculum were developed by a curriculum team and been subject to a broad consultation process (electronic questionnaires, seminars, meetings) that has involved schools, school owners and the social partners. The Norwegian strategy towards VET attempts to bridge the general and vocational divide and particularly the gap between the vocational schools and the apprenticeship system. The most important reform in this regard is "Reform 94" in 1994, which encompassed rights, structure and content.

Legislation

Reform 94 produced changes in several aspects of VET. At the upper secondary level, both the act regulating education and training in schools, and the act regulating apprenticeship training were revised and harmonised with the aim of achieving a more uniform education and better coordination between education in school and training at work.

The Formal Vet System

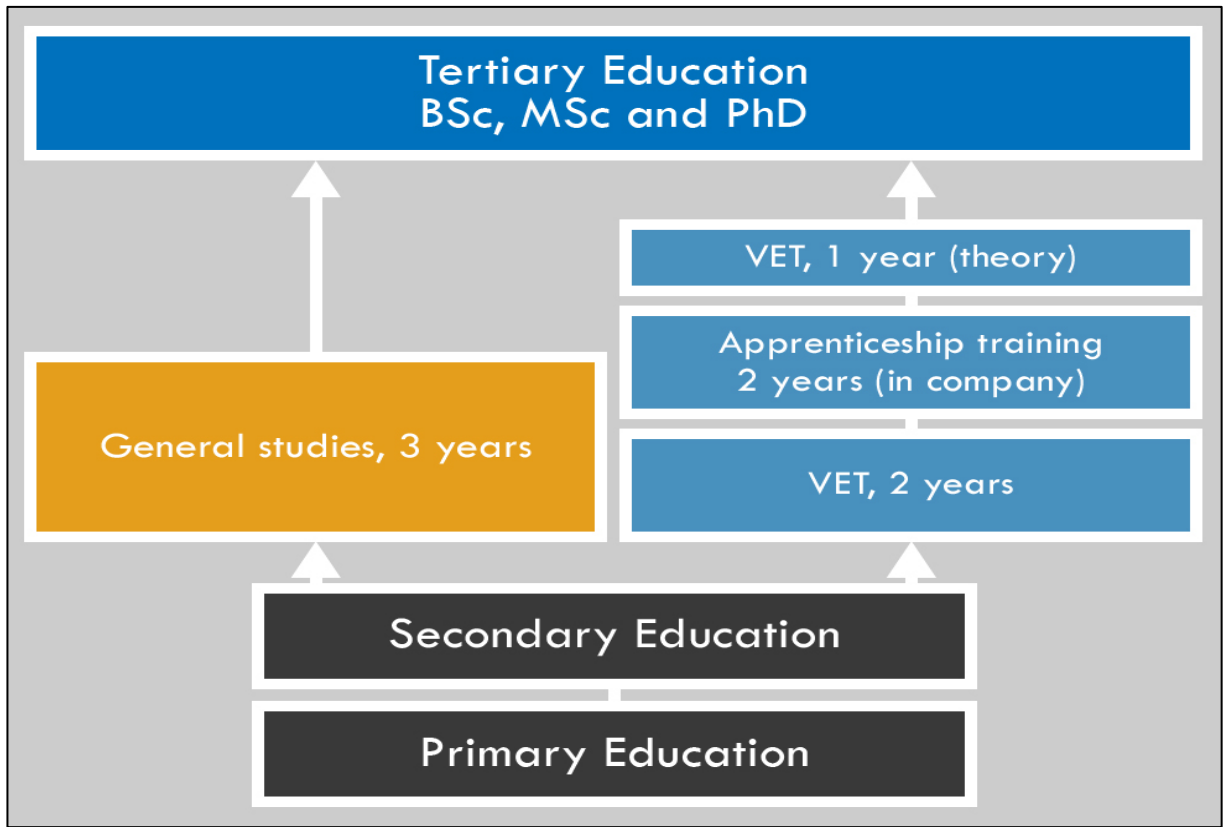
Levels:

Tertiary education, age above 19

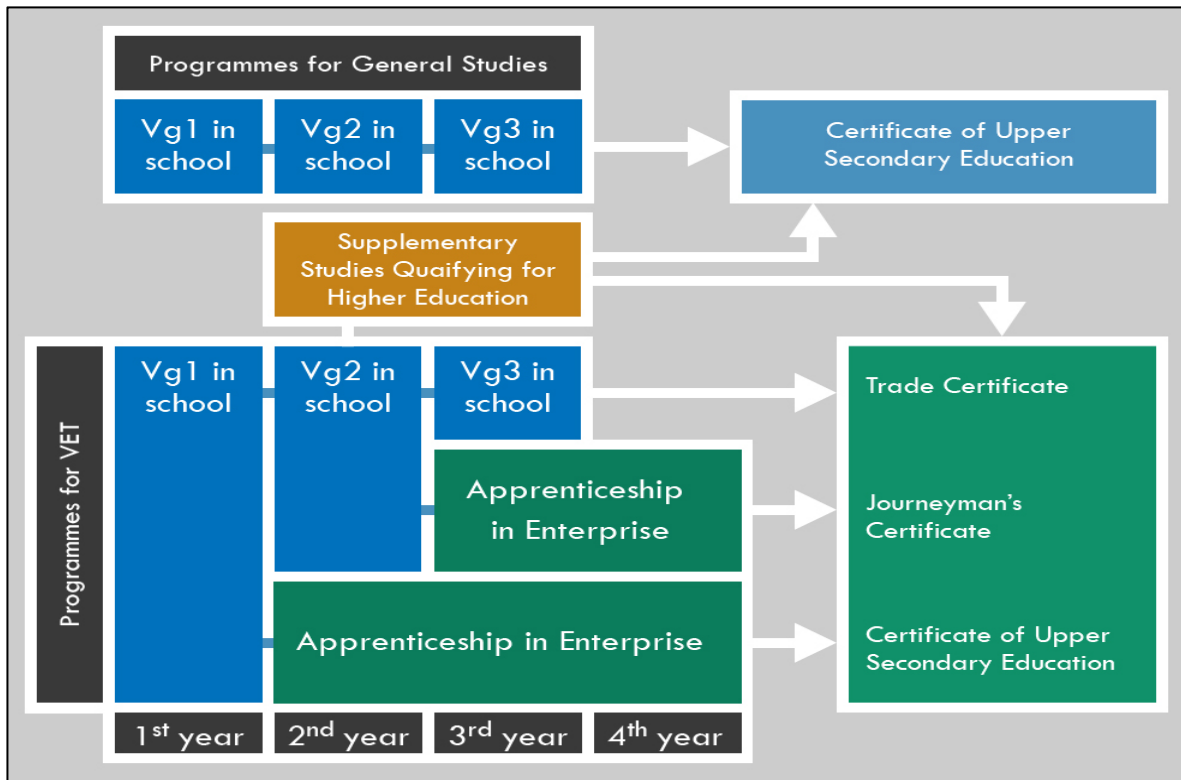
Upper secondary education, age 16-19

Secondary education, age 13-16 compulsory

Primary education, age 6-13 compulsory



Figures 1 and 2: The main educational levels in the school system in Norway.



The organization of the upper secondary VET education in Norway, including the apprenticeship system. Another way to illustrate the educational system illustrated in the left figure.

All young people leaving compulsory school have a statutory right to attend three years of upper secondary education. Since 1976, general and vocational education and training were subject to the same law, under the same roof. Thus, today many upper secondary schools provide both general education and vocational training, often in the same building. Students may choose from twelve programmes categorised as three general studies programmes and 9 VET-programmes. The VET-programmes are as follows:

- Technical and Industrial Production
- Electrical Trades
- Building and Construction
- Restaurant and Food Processing Trades
- Agriculture, Fishing and Forestry
- Health and Social Care
- Design, Arts and Crafts
- Media and Communication
- Service and Transport

The upper secondary VET leads to the trade- or journeyman's certificate ("fag- og svennebrev"). The majority of upper secondary VET students are in the age group 16-21.

VET models

Upper secondary VET normally includes two years at school with practical training in school workshops and short work placements in industry, followed by two years of formalised apprenticeship training and productive work in an enterprise or public institution. During the last two years, the apprentice is engaged in one year of training and one year of productive work. This is known as the "2+2 model". However, not all VET programmes follow the 2+2 model. A few programmes are entirely school-based. Another small group of programmes follow a "1+3-model", with one year in school followed by three years of apprenticeship training.

The 2 first VET years

The first year in upper secondary VET consists of general education and introductory knowledge of the vocational area. During the second year, VET students choose specialisations and the courses are more trade-specific. While in school, students participate in practical training in workshops and enterprises through the subject In-depth study project ("prosjekt til fordypning"). The two-year apprenticeship takes place with an employer (or employers) and follows the national curriculum. In Norwegian higher education, all vocationally oriented courses and programmes are part of the ordinary higher education system. There is no formal or other distinction between vocational and non-vocational higher education.

Tertiary Vocational Education

The Tertiary Vocational education ("fagskole") is an alternative to higher education and is based on upper secondary education and training or equivalent informal and non-formal competence. A Higher Education entrance qualification is not required. The education consists of vocational courses lasting from half a year to two years. After 2007, all providers must document quality assurance systems. It is also possible to obtain institutional accreditation for programmes within a defined field of study, rather than having to apply for recognition programme by programme.

Governance

Norway enjoys a high degree of decentralisation amongst the three administrative levels:

- State,
- County
- Municipality

The municipalities (“kommuner”) are responsible for primary and lower secondary education. While county authorities (fylkeskommuner) are responsible for public upper secondary school, their associated tasks include: operational responsibilities for the development of curricula, examinations and quality control, running of schools, the intake of students, and the appointment of teachers. The Ministry of Education and Research (“Kunnskapsdepartementet”) has the overall responsibility for national policy development and administration of education and training at all levels, from kindergarten to higher education, including adult education. Higher education falls directly under the responsibility of the Ministry.

For upper-secondary (tertiary) vocational training (“fagskole”), the situation is slightly more complicated as the counties are responsible for most of the public funding, most schools are private, and a few schools are funded directly by the Ministry.

Curriculum development

The Directorate of Education has responsibility for the continuous curriculum development. For this purpose it makes extensive use of expert groups from both school and companies that provide upper secondary education. When the need for a new qualification is identified, a tripartite group is set down to write vocational profiles (“kompetanseplattform”). This will make the basis for developing the subject curricula. The Directorate appoints teams for curriculum development consisting of professionals (most often suggested by the employer and employee organisations) and VET teachers. Also, the Directorate has recently developed a follow-up system for curricula called SOL (“System for oppfølging av læreplan”). The system aims is to get a more holistic and systematic knowledge about the state of affairs with regards to the curriculum.

Financing

Norway spends considerable resources on its education system, including VET, relative to many other countries. For instance, Norway spends more than the OECD average in Education per student. In 2008, Norway spent 5 per cent of its GDP on primary and secondary education and training as a whole, whereas the OECD countries spent only 3.8 per cent on average. There are no school fees at any level, including higher education, in the public education system. The finance comes from country authorities for public upper secondary schools while the Directorate of Education is responsible; include finance, for tertiary education. Only a small share of pupils and students attend private education. The Financial Support to Students and Pupils Act (“Lov om utdanningsstøtte til elever og studenter”-1985, latest amendment 2005) states that all registered students on formally recognised study programmes, at both public and private higher education institutions may receive grants and subsidised loans from the State Educational Loan Fund (“Statens lånekasse for utdanning”) for subsistence costs.

2. Aquaculture VET system in Norway

(Vocational Education and Training)

In order to receive a Journeyman Certificate (“Fagbrev” in Norwegian) in aquaculture, the candidates have to pass a theoretical and practical exam. Both young and elderly candidates, like staff in fish farming industry, must pass the same exams, since the curriculum in aquaculture is the same.

Staff that are currently employed by fish farming companies, today have two options if they want to receive a Journeyman Certificate. They may:

- Become an apprenticeship for 2 years (Option 1), which is part of the ordinary study path for young students age 16-21, or
- Become candidate of practice (Option 2) after working full time in a relevant job in fish farming industry for 5 years.

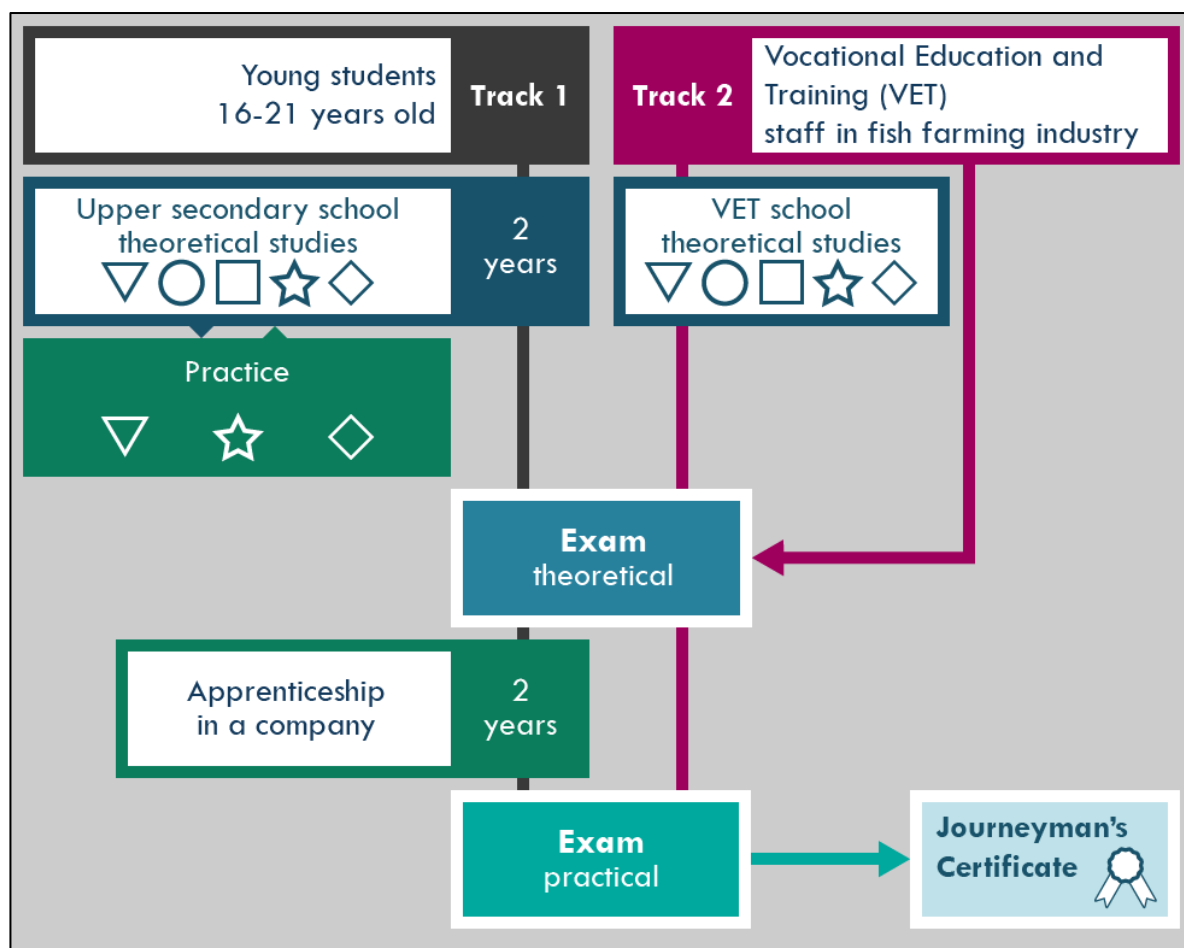


Figure 3: The vocational educational and training levels in the school system in Norway. Track 2 represents the aquaculture industry training provided to their staff.

For each option the candidates have to pass a theoretical exam first, before they may take the final practical exam. The practical exam may take up to two days to complete.

Both options however, have some limitations that make it less attractive for those who are already in full time employment to take the journeyman certificate. To be an apprentice means that they lose income since the salaries are lower. To be a candidate of practice requires that you wait for five years or longer if you have a full or part time position.

The downside of both options, is that many do not have the desire to go out of work to get a Journeyman Certificate. Thus, the fish farming industry in many cases support their staff by engaging the existing VET schools to offer a separate course (Option 2) for their candidates. These courses may apply flexible training solutions consisting of a combination of e-learning and on-site training, in such a way that it is possible to take the courses when the candidates are in full time employment that in most cases are located in rural areas along the coast of Norway.

The government in Norway is currently (2017) preparing a third path “Fagbrev på Job” (“Option 3”), where a person after one year of full time employment in a company, may apply for and sign a contract with the County and the employer. They will both give guidance and training that leads up to the Journeyman Certificate, while the candidate at the same time does not lose out financially due to a salary reduction. The contract will depend on the individual’s real expertise. For some it may stick with training in under one year, while the maximum duration is four. This is going to be achieved by integrating lifelong learning into VET.

How VET courses, leading to a Nationally Qualification (NQ) in Aquaculture, are implemented.

VET models for young students without work practice.

Upper secondary VET normally includes two years at school with practical training in school workshops and short work placements in industry, followed by two years of formalised apprenticeship training and productive work in an enterprise or public institution. During the last two years, the apprentice is engaged in one year of training and one year of productive work. This is known as the “2+2 model”. However, not all VET programmes follow the 2+2 model. A few programmes are entirely school-based. Another small group of programmes follow a “1+3-model”, with one year in school followed by three years of apprenticeship training. This leads to the Norwegian Trade- or Journeyman’s certificate (NRQ).

VET model for adult workers from industry.

For adult workers with five years of work practice or more, some VET schools provides a shorter route to the Trade- or Journeyman’s certificate. These schools often have their own or an allied training centre that provides tailor-made courses for this group of students/participants. These courses are nevertheless ended with a nationally approved (the Norwegian Directorate of Education) theoretical exam (five hours’ duration) for the program. When the participants have passed the theoretical exam for the vocational program and have documented at least five years of relevant practice from the industry, the participant must complete and pass a practical examination for the VET program. Then the participant will be issued the Norwegian Trade- or Journeyman’s certificate for the VET program. Norwegian VET schools have a very close cooperation and continuous contact with the industry connected with the relevant vocational program and this applies to the highest degree for the Aquaculture industry. Through this cooperation, the need for courses and course participants from the industry are recruited.

Implementation of VET courses for adult workers in industry.

Each training centre or school have a lot of freedom from the Norwegian authorities on how the

courses are implemented. Since the participants in these courses have at least five years of practice, no requirements are imposed on length or duration of the courses. There are also no requirements for practice as a part of the training. Therefore, there are different practices on the duration of the courses from school to school. This is also based on a prior learning assessment of each participant group. These courses, however, have considerably shorter duration than the courses connected with the VET models for young students without work practice. Typically, the course duration is between 60-100 teaching hours. The courses are mainly conducted as classroom-based courses where the participants meet at the training center's localities for training lessons. There are however a few examples that, at least, the "easiest" parts of the courses may be implemented as e-learning. A training lesson is typically provided outside the normal working hours in the industry and may last for four teaching hours.

The theoretical examination.

The theoretical exam (written) must be completed in five hours at the most. This is an example of a typically exam assignment:

"Situation description":

You work as an operator in a fish farm and will participate in one large work operation at the plant.

The work involves the handling of live fish.

It is important that you take into account fish welfare and quality, current standards and regulations and efficient operation. The completion of the work operation required good planning, control and documentation.

You choose the type of plant, breed species and work operation.

Task:

Describe, evaluate and give reasons for your solution choices for the work operation.

As we can see, the exam always involves a relevant case where the candidate has to combine and apply the knowledge from the whole course to get a good grade.

The practical examination.

The implementation of the practical exam usually extends over two to three days. The practical exam will preferably be held in the company where the main part of the study period is completed. The test committee must approve the place the exam is to be held in order to ensure that the conditions for the exam are satisfactory.

Day 1:

Exam hand out and planning. The candidate shall have time to set up a plan for the exam when the task(s) are handed out, and the solutions chosen shall be justified.

Day 2:

After the planning is finished, the candidate starts the work, which must be in accordance with the plan. The candidate shall evaluate his/her own exam work and describe any deviations between planning and implementation.

Finally, the candidate must create a total document of his own exam work. The test committee can ask questions for professional clarification related to the tasks that have been done during the exam. The tasks that are given during the exam reflect what the apprentice is expected to be able to do after the study period. The tasks will be based on the competence goals in the curriculum, and the tasks will test the candidate in the following:

- planning of work and justification for chosen solutions
- implementation of professional work
- assessment of one's own exam work
- documentation of own exam work

The apprentice must have enough time on the task(s) to be able to show quality in the work he/she performs during the exam. All the aids the candidate has had access to during the study period may also be used during the examination.

Day 3 (or 2):

After the test is completed, a test protocol is completed which the Examiner signs and returns to the county authority (exam authority for VET programs). The county authority then gives the candidate written notification of whether the exam is successfully passed or not.

The candidate nevertheless receives immediate oral feedback from the Examiner on whether or not the exam is passed. The county authority finally issues the formal Trade- or Journeyman's certificate to the candidate.

Assessment in the Norwegian VET system

General assumptions:

Assessment in Norway VET is regulated by The Education Act and the regulations connected to this law, chapter 3 – "Individual assessment in primary and upper secondary education". Pupils in public primary education and students, apprentices, diploma candidates and apprentices in public upper secondary education are entitled to individual assessment by the law. The right to assessment includes a right to continuous assessment, final assessment and documentation of the training.

The school owner is responsible for ensuring that the student or apprentice gets fulfilled its right to individual assessment according to the Education Act. For apprentices and private candidates in companies, the learning company is responsible for ensuring individual assessment.

Purpose of assessment according to the regulations:

The purpose of the assessment is to promote learning, express the competence of the student or the apprentice during the course and also at the end of the course. The assessment will provide good feedback and guidance to students or apprentices.

The assessment scale:

At High School and Upper Secondary School (VET) level, assessment will be given with grades in numbers. There will always be grades in numbers, on a scale from 1 to 6.

The individual grades have this content:

- Grade 6 expresses that the student has advanced competence in the subject
- Grade 5 expresses that the student has very good competence in the subject
- Grade 4 expresses that the student has good competence in the subject
- Grade 3 expresses that the student has quite good skills in the subject
- Grade 2 expresses that the student has low competence in the subject
- Grade 1 expresses that the student has very low competence in the subject.

In order to pass the subject, grades 2 to 6 are required.

Continuous assessment:

Continuous assessment in subjects will be used as a tool in the learning process, and as a basis for adapted training and help to the student or apprentice to increase his / hers competence in subjects. This assessment in subjects must be given on a continuous and systematic basis and may be both verbal and written. Continuous assessment must contain information about the competence of the student or apprentice and provide guidance on how he or she can develop his or hers competence in the subject.

The correspondence between continuous assessment and final grade in subjects:

Continuous assessment should promote learning and allow the student to improve his / her competence throughout the entire training period. For students in public upper secondary school the competence the student has shown throughout the entire training period forms part of the assessment when the final grade in subjects is to be determined.

For adult private candidates and apprentice in adult learning courses the final exam will determine the final grade. However; also the adult students is entitled to continuous assessment throughout the courses.

Examinations in the Norwegian VET system:

General assumptions:

The exam must be in accordance with the curriculum.

Specific prerequisites for professional certificate tests (practical):

The county authorities is responsible for the completion of the professional certificate test in accordance with the regulations and the curriculum in the subject. Registration for the professional certificate test must be sent to the county authority in the county where the learning contract or training contract is registered.

Private candidates must apply for a professional certificate test. The application goes to the county authorities before the deadlines set by the same county authorities.

Before applying for the professional certificate test, the candidate must have passed a theoretical examination according to the prerequisites set by the Directorate of Education. This exam will test to what extent the individual candidate has reached the competence objectives set out in the curriculum. The exam is prepared centrally and censored locally. If the candidate does not pass the examination, a new examination may be reapplied at the earliest six months later.

The contents and scope of the (practical) professional certificate test:

An Examination Board for the program subject is responsible for the design of the professional certificate test. The teaching company, possibly the school as an alternative to training in a company, can make suggestions for work tasks.

The professional certificate test will test the candidate's competence in the subject as described in the curriculum for the profession. All the competence objectives in the curriculum for the subject is objects for testing. The assignments in the test must reflect requirements for professional competence. The Examination Board is responsible for ensuring that the candidate's competence in the subject is tested in a sound manner.

The task should clearly define the content of what is expected of the candidate's work. Within the framework of the competence goals in the curriculum, the assignment will test the candidate in

- A. Planning of work, and foundation for selected solutions
- B. Carrying out a professional work
- C. Assessment of own test work
- D. Documentation of own test work.

The extent of the test should be clearly defined, and within the timeframe set in the curriculum. In a summary conversation, the Examining Board may ultimately ask the candidate questions for professional clarification.

The assignment must be designed in such a way that it gives the candidate a realistic opportunity to perform a good quality work within the stipulated timeframe. The assistive the candidate have been using during the learning period, can also be used during the test. It will be clear how the different parts of the test should be delivered.

In addition to the task, the Examining Board shall prepare a basis for assessing the candidate's work with the examination. The main points of this basis must be explained to the candidates.

The Examination Board

The Examination Board for professional certificate tests is appointed and administered by the county authorities, according to the Education Act. The examiner must have at least two members who have formal professional competence within the subject area and, as far as possible, have updated work experience in the subject. The county authorities must ensure that there is satisfactory assessment competence in the Examination Board.

The county authorities shall collect proposals for members to the Examination Board of the parties of the business sector (Employer's side and the employee side). The county authorities may also, if necessary, retrieve suggestions from others.

3. Procedures for change in vocational education programs (VET) – Norway

All Norwegian education programs and schools at the upper secondary school level (also VET programs) must be approved by the Norwegian Directorate for Education (UDIR). This applies either to private or public schools. The vast majority of Upper secondary schools are public schools.

The BlueEDU project has at two occasions been in contact with the Norwegian Directorate for Education to obtain advice on changes in the vocational education for Aquaculture. This at the national FosFor conference in 2018 and 2019. The Directorate refers to its general guidelines for applications for new programs and subjects, as well as changes in programs and subjects. Here are some of the main points:

In order for the VET program structure to change, an application must be sent to the Directorate for Education. Own procedures have been developed for changes in VET programs. Procedures rendered here apply to applications and consideration of amendment proposals.

Consideration of applications for change in VET programs in 2018 and 2019

In consultation with the Ministry of Education, a new established structure is pointed out. Until the new program structure is effected, it will still be considered in consultation with the academic councils individually. This is described in the Cooperation Guidelines - SRY, Academic Council and UDIR.

It will be considered whether it is possible to include any amendments that come during this period in the work on new curricula. This means that when it comes to applications for “cross-loop” between programs, merging of subjects and splitting of subjects where the content of the new curricula is unknown, it is considered whether such changes should also apply in a new program structure.

Proposals for new subjects in 2018 and 2019 will probably not be implemented until 2020 due to the timeframe.

Premises for change

The VET supply structure in upper secondary education published in circular Udir 1 has the status as a regulation, “Regulations to the Education Act §1-3. If changes to the VET supply structure are to be made, this has to comply with the provisions of the Public Administration Act on investigative duty, advance notice, statement from stakeholders, formal requirements and announcement.

The Directorate of Education examines the applications. The investigation report shall state what is to be changed, why it should change and the consequences of the amendment. The relevant academic council related to the specified education program referred to in the amendment, advises the Directorate for Education in the process. The inquiry will be sent to a public hearing, so that stakeholders will have the opportunity to comment on the proposal and noted that there may be a change. The Ministry of Education determines changes in the VET supply structure.

The application for change in VET program structure

The Directorate of Education has categorized the amendments that describe the basis for applying for a change in the VET program structure:

1. Program name changes
2. Application for “cross-loops” between programs

3. Breakdown of program areas and learning subjects
4. Merger of program areas and learning subjects
5. Change of the training model
6. Suggestions for new program areas and teaching subjects
7. Other changes

Application for change of name

The basis for applying for a change in the names of VET programs, program areas or subjects is that any new name will be perceived as more correct or will give a better understanding of the program.

Application for new “cross-loop” between programs.

A national “cross-loop” means that students can be admitted to a program area or a subject that is based on a different education program or program area than the student has completed. The basis for granting a cross-loop proposal is that there are so many common components between the curricula that the students have the necessary prerequisites for following the program in the program area or the subject he or she is admitted.

Application for fragmentation of program areas and subjects

The basis for applying for fragmentation of program areas and subjects is to:

- The workforce has considered that the need for competence is better taken care of by the fragmentation of teaching subjects
- The content of the curricula is so extensive that splitting gives a more professional education
- The apprenticeship companies are so specialized that it is difficult to provide training in all the competence objectives of the curriculum

Application for merger of program areas and subjects

The basis for granting application for merger of program areas and subjects is to:

- development within the subject indicates increased need for broad competence
- it is documented a changed competence requirement

Application for change of training model

An example of the change of training model can be, for example conversion from 2 + 2 model to 1 + 3 model. The basis for applying for a change in the training model is in cases where the workforce has considered that alternative models will satisfy the need for competence in a better way. There is also a basis for change if the content of the curriculum is so extensive that it is difficult to provide professional training and any breakdown of the subject will be unfortunate for the development of the subject. Changes in the training model may also be approved if international development of the subject indicates that the Norwegian subject should be adapted to the same development.

Application for new program areas and subjects

The basis for approval of applications for new program areas and subjects is a defined need for new competence. An occupational field of study that is to be developed into a new program or subject area must satisfy the requirements for width and specialization at a level corresponding to other program areas and subjects. Proposals for new programs will as a rule be adapted to the main model with two years of training in school and two years as an apprentice in a company. A new subject must be of such a nature that it is possible to perform the profession after passing the examination qualifying for a Craftsman's or Journeyman's certificate. The distinctive nature of the new subject must be such that essential parts of the training do not overlap with related programs.

The application must contain:

- Description of the program area or subject content, and a supplementary overview of the competence a professional worker will achieve after completing the program.
- Any overlap or boundaries to related programs must be described.
- Estimates of the number of practitioners in the industry, estimates of the expected number of apprenticeships and the need for skilled workers in the coming years.
- The need for new recruitment must be explained and rendered probable.
- Proposed location in the program structure and whether it is proposed in an alternative path.
- A description of the program area's history.
- Proposal for a program name and occupational term.

The application should be promoted jointly by the affected stakeholders on both the employer and the employee side in industry. Alternatively, statement from the responsible stakeholders must be attached to the application.

Other changes

An example of other changes may be the closure of programs.

Deadlines

Changes with relevance for students applying for an upper secondary education should be decided and announced before the end of the year before the program structure is due. However, proposals for new program areas or subjects can be promoted continuously, as such proposals will require a relatively substantial follow-up with, for example, the preparation of curricula. The amount of time spent on follow-up will be difficult to determine in advance.

Scottish VET supply:

4. National Policy

Mission

The Scottish VET system is an integral part of the national education system and includes college and work-based courses and qualifications. All young people leaving their compulsory schooling have a right to attend four years of College and/or University education, without incurring any course fees. VET is widely available, as both the main stream VET colleges and private training providers have been encouraged to widen access. Scottish VET is instrumental within economic development and the government expects VET providers to involve employers in VET design to ensure that their provision is fit for purpose. Consequently, UK Sector Skills Councils have been established to lead industry sector groups in defining their occupations and occupational standards, in terms of the knowledge and skills required at each occupational level.

Strategy

The Scottish Credit and Qualifications Framework (SCQF) has been created to allow meaningful comparison between the academic levels of Secondary School (Pre-16), College, University and Work Based Qualifications. This has enabled a wide range of 'Qualification Pathways' to be created with various entry and exit points within the system. Learners have greater flexibility and improved access in support of government life-long learning policies. Consequently, VET is more successfully promoted as an alternative pathway to Higher Education for many learners. Policy makers have been striving for 'parity of esteem' between VET and the more traditional academic Higher Education pathways, using the SCQF to demonstrate equivalencies between qualifications. Universities are increasingly recognising VET qualifications for entry to the first, second or third year of their Degree programmes, via well-defined articulation arrangements.

The Scottish Qualifications Authority (SQA) manage the development and validation of new and revised VET qualifications. They provide a national Quality Assurance system to ensure that the standards applied to assessment of their National Qualification do not vary, irrespective of which SQA approved centre delivers the Award. Each SQA Qualification is developed by a well-qualified and experienced Qualifications Development Team led by VET practitioners, but subject to consultation with industry. The current National Occupational Standards (NOS) developed by the appropriate Sector Skills Council must inform the development and revision of all National Qualifications.

Legislation

The Education Scotland Act 1996 created the Scottish Qualifications Authority as a corporate, non-departmental public body of the Scottish Government, responsible for governing Education in Scotland. Although the SQA is best known for the delivery of the annual diet of public examinations within Scotland's Secondary Schools, the Act also made them responsible for accrediting a wide range of other Educational Awards, including VET within the tertiary education system

5. The Formal Educational System

Levels

Higher Education, including Higher National Certificates (HNC) and Higher National Diplomas (HND) are offered by colleges to learners of 17 years old and above who have the Scottish Highers required for direct entry.

College VET, up to SCQF 6, is provided to learners who have reached or passed the mandatory minimum school leaving age (16 years), and have been accepted on a VET programme appropriate to their academic level.

Secondary education, provides is compulsory for learners from age 12-16.

Primary education is compulsory for learners from age 5-12.

Types of VET provision

The Further Education (FE) Colleges in Scotland provide a very wide range of full time VET courses covering all trades and vocations. This includes full time course at the craft skill or operative level (SCQF 1-6) and 'higher technical and/or supervisory level (SCQF levels 7-8). Higher VET' as it is commonly known can also prepare learners for progression to University Degree programmes where articulation arrangements are in place. FE/HE articulation pathways were very successful in preparing aquaculture students for employment in the 1990s and early 21st century, but have more recently lapsed.

In addition, the Scottish VET system offers two types of work-based qualifications:

- Modern Apprenticeships popular with school leavers seeking immediate employment who want to 'earn while they learn'.
- The National Progression and Professional Development Awards are commonly used by companies for their formal Continued Professional Development (CPD).

6. Mainstream Vet Qualifications

The hierarchy of the main Awards undertaken in Scotland's VET system are described and summarised below. All qualifications are made up of defined Units prescribing the learning outcomes, performance criteria and assessment evidence requirements. This is to ensure national standardisation of VET assessment and quality, in the interests of learners, irrespective of their SQA approved centre location.

- 1 Year Access courses – 12 credits (SCQF 2-4)
- 1 Year National Certificates (NC) – 18 credits (SCQF 5-6)
- 1 year Higher National Certificates (HNC) – 12 credits (SCQF 7)
- 2 year Higher National Diplomas (HND) – 30 credits (SCQF 8)

Every trade and vocation is catered for within the Scottish VET system and for the vocations in highest demand there are many providers to choose from nationally. Although conventional academic studies stop at age 16 years for those leaving school, most SQA VET Qualifications integrate the development of transferable core skills. Every employer demands these skills, irrespective of the vocation:

- Numeracy
- Communication
- Working with others
- Problem solving
- Information Technology

Most of Scottish College VET students are in the age group 16-24 and embark on a specialist courses in the vocation of their choosing. Through the application of well-designed qualifications structures, learners can often specialise by choosing a defined number of Optional Units within their Award Framework. All of the Units undertaken have meaningful titles, which are reflected in the learners' final SQA certification.

Conversely, the work based Modern Apprenticeship has no pre-determined duration, but does also allow flexibility through a core and optional Unit structure. They have been devised to suit a diverse group of mature work-based learners who are at various stages of their career, from new entrants to the more experienced. Therefore, programmes of study are often individualised by a tutor and/or assessor and this process can be assisted by the Accreditation of Prior Learning (APL)

- MA Level 2 Operative (SCQF 5)
- MA Level 3 Supervisory (SCQF 6-7)
- MA level 4 Managerial (SCQF 8)

Common VET pathways

Commonly, entrants to the VET system leaving school at age 16 have not undertaken Highers and are therefore ineligible for entry to Higher VET or University Degree programmes. By undertaking a VET qualification, they can be prepared for entry to a trade or vocation at the operative level.

Learners who have taken their Highers but lack sufficient grades to gain direct University entry often undertake Higher VET in a College. This can lead to a higher technical level of employment and/or supervisory responsibilities.

Conversely, many earners will often enter employment at age 16 on leaving compulsory education and start their apprenticeship at SVQ level 2. They can in time progress to level 3 (supervisory) and ultimately level 4 (managerial) MA programmes.

The Modern Apprenticeship at level 3 can often be accessed following a full time College based National certificate at SCQF level 5. Progression pathways composed of work and college-based qualifications are very effective as they allow the learner to develop and progress at a pace that suits them and their circumstances. Typically, a level 3 Modern Apprenticeship will take a minimum of 2 years for a 16-year-old school leaver to complete.

Currently learners have access to the MA in Aquaculture only, as college-based aquaculture VET became unavailable in Scotland from 2012.

Governance

Scotland has one VET Awarding Body, the SQA, which is responsible for the approval of all VET centres delivering SQA Awards, validation of new VET qualifications and the quality assurance of all approved VET providers internal assessment practices.

It is possible for an SQA approved centre to apply for devolved authority to validate and/or approve the delivery of SQA Awards, once they have demonstrated that they operate robust and compliant internal Quality Assurance systems.

Curriculum development

Some qualifications are developed at national level by selected committees of experts. This includes the secondary school examination diet and SQA led VET provision in high demand. In addition, any SQA approved centre can propose new SQA qualifications to satisfy local learner and industry demand.

All new qualifications (Awards) proposed by providers and revisions to existing awards must undergo rigorous validation process led by an SQA Development Officer. Robust market research is required to establish the needs of the target audience and to demonstrate that there is a sufficient and sustainable demand from potential learners and the industry in question.

The Award will normally target a defined occupational level, and therefore, the current NOS provide a description of the knowledge and skills requirements. From this, Awards can be constituted in broad terms to determine the subject areas/ SQA Units.

Once this Award framework of Units is agreed, Learning Outcomes and Performance Criteria can be written for each Unit, to define the knowledge and skills to be assessed. Finally, the evidence requirements prescribed in each Unit define the nature of the assessment process that must be applied consistently by all centres delivering the Award, once it has been validated. The NOS must be interpreted carefully to ensure they are all incorporated somewhere within the appropriate Units and this should be made evident to industry representatives during the approval process. Each Unit of a college based National Qualification has a credit value. One credit is equivalent to 40 hours of teaching, learning and assessment activity, whatever its nature and whether it is teacher or earner led.

The work based Modern Apprenticeships, although also informed by the same NOS make no assumptions about credit values and their duration is entirely dependent on the individual learner's

background, previous knowledge and experience. Individual learning and assessment plans drive the delivery process.

Financing

Each public-sector College is led by an independent Board of Management responsible for governance at college level. Each college receives a government Scottish Funding Council (SFC) grant for the delivery of qualifications. In addition, they can bid for Skills Development Scotland (SDS) grants to support the delivery of Modern Apprenticeships in the work place. Private training providers cannot access SFC grant, but can and do successfully bid for SDS funding to support Modern Apprenticeship delivery.

7. Scottish Aquaculture Vet Legacy

Throughout the 1980's and 90's, a growing Scottish Industry was supplied many of its new entrants by three well-equipped Aquaculture Colleges. They provided new entrants with Scottish Qualifications Authority (SQA) qualifications at fish husbandry and site manager level, gained through full time attendance on Aquaculture VET courses. This provision has been lost.

Today, Inverness College and the North Atlantic Fisheries College (NAFC) Shetland provide the work based Modern Apprenticeship (MA) in Aquaculture. This National Qualification is also provided by a Scottish private training provider, Polaris Learning Ltd, based in Aberdeen (North East Scotland). Increasingly the MA Level 2 (SCQF 5) is used as an entry qualification for school leavers after they have gained full time employment with a company. In addition, the salmon farming companies have developed their own in company training schemes aligned to company Standard Operating Procedures (SOPs).

8. The Current Scottish Work-Based Training System (The Modern Apprenticeship in Aquaculture)

Age of entrants

New entrants can start a Modern Apprenticeship at level 2 (husbandry/operative) on leaving school at age 16 and can progress to level 3 following their promotion to supervisory level. Mature learners can complete the MA at any age and stage of their career, to gain a recognised National Qualification.

Entry requirements

There are no formal academic entry requirements to the MA at level 2. The learner must be employed by an aquaculture company willing to support them and co-operate with the training provider regarding practical training and assessment.

Modern Apprenticeship structure and content

National Occupational Standards (NOS) devised by industry have been used to define the practical skills and knowledge assessed by the MA validated by the Scottish Qualifications Authority (SQA). It is composed of mandatory Core Units, in addition to a prescribed number of Optional Units, at each level, selected to suit the nature of the farm operation and the learners' and employers' needs.

Individualised Learning

The 'core and options' structure provides the flexibility to facilitate individualised learning and assessment to suit the farm operation and learner. For example, a learner based on a freshwater smolt facility, would normally only elect those Optional Units relevant to the freshwater phase of salmon production.

It is possible to enhance an individual learners' development plan by adding Units additional to the minimum requirement. All Units achieved will appear on the learners final SQA certificate, as evidence of their knowledge and skills.

MA delivery and assessment

The assessment of practical skills must be undertaken in the work place, through many methods, including, observation by a qualified assessor and witness testimony provided by an experience supervisor.

The assessment of knowledge can be undertaken in a college or other supervised learning centre. It can also be undertaken on a farm, if invigilated, supported by the VET provider.

The learning process often includes a combination of approaches: supported distance or e learning, college block attendance (1-2 weeks), short course attendance and practical skills training on farm.

Company based training schemes

In response to the decline in full time college-based provision and the relatively low levels of MA funding available for 'mature' work based learners the aquaculture companies have become self-sufficient. Company' training schemes has been developed and have become increasingly, and include initial induction, comprehensive training schemes and supervised work experience. Their delivery and assessment is driven by company Standard Operating Procedures (SOPs). However, they do not lead to a National Qualification and are not subject to quality assurance by an approved VET provider or authority. Therefore, a relatively high proportion of the Scottish Aquaculture workforce do not hold a National Qualification relevant to their occupational role, despite having developed considerable skills and knowledge, in many cases.