

**ZSL**  
Zentrum für Schulqualität  
und Lehrerbildung  
Baden-Württemberg



Co-funded by  
the European Union

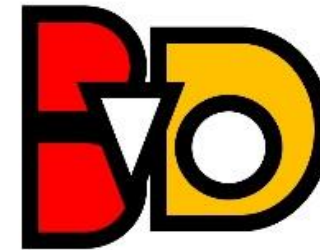


**SAVO**  
VOCATIONAL COLLEGE



# BYOD in VET

## - a brief overview



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## 1) Short Overview of VET school systems in Germany and Finland



### Germany

Source: [https://commons.wikimedia.org/wiki/File:Flag\\_of\\_Germany.svg](https://commons.wikimedia.org/wiki/File:Flag_of_Germany.svg)



### Finland

Source: [https://commons.wikimedia.org/wiki/File:Flag\\_of\\_Finland.svg](https://commons.wikimedia.org/wiki/File:Flag_of_Finland.svg)

#### Structure of vocational dual education: two learning sites

German vocational training takes place at two training locations: the company and the vocational school. The company takes over the practical side of the training, fixed via an apprenticeship contract between student and employer. Whereas the vocational school conveys the theoretical knowledge required to carry out the occupation the students are training for. Learning content is, for the majority of occupations, no longer taught in individual subjects but in what are called fields of learning (didactical-curricular organisational units), i.e. within the framework of self-contained subject areas. These are oriented towards practical, job-related procedures.

Studying at the workplace is either based on apprenticeship or on training agreement. Both can be flexibly combined. Learning at work can be used to acquire competence in all vocational qualifications as well as other training advancing or supplementing vocational skills. Studying at the workplace can cover an entire degree, a module or a smaller part of the studies. The apprenticeship is based on a fixed-term contract between the student and the employer. The student is a full-time worker and receives pay. In the training agreement, the student is not in a contract of employment and does not receive any pay or other compensation. This agreement is drawn between the education provider and the workplace.

#### Organisation of VET

The Federal Ministry for Education and Research coordinates with the federal government regarding the contents and design of vocational training in Germany. Legal bases such as the Vocational Training Act (BBiG) form the stable foundation of vocational training. This basis is regularly adapted to current challenges. The vocational school system is federally organized as part of the school system; the German federal states with their Ministries of Education are responsible for the vocational schools. These state ministries coordinate the teacher training, recruitment, statistics and all areas of schooling. The federal government is in charge of in-company, extracurricular vocational training.

The Government decides on the development of VET in the Government programme. The Government also makes decisions on the structure of vocational qualifications. The Ministry of Education and Culture prepares legislation related to VET and steers, regulates, finances and monitors the industry. The Finnish National Agency for Education (EDUFI) prepares the national qualification requirements for vocational qualifications and preparatory education and training for VET. EDUFI also develops education and training through funding projects, in-crases the productivity of education and supports internationalisation of the Finnish society.

#### Individual pathways

Vocational education and training has been developed as an integral part of the education system, with the aim to lead to both employment on the labour market and further studies in either tertiary education or further vocational qualifications. Educational policy has sought pathways that are open from basic education to higher education with no dead-ends.

#### Financial matters

National and local government are responsible for financing VET as part of the state budget. Apart from learning materials, VET is free of charge to students. Dual VET-students get a reduced salary from their employer. Students are entitled to a free meal and school transport subsidies.



## 2) Most used software in digital lessons - recommendations & data security

→ Mainly used digital communication platforms for smartphone and pc

Platform	Pro	Contra
BigBlueButton & Moodle (used in Germany)	Baden-Wuerttemberg provides Moodle instances free of charge including BBB integration for all schools.	Web-Based only. No native apps for mobile devices.
Nextcloud (used in Germany)	Baden-Wuerttemberg provides a data secure cloud for saving and exchanging data.	Web-Based only. No native apps for mobile devices.
Wilma (used in Finland)	Extensively used for all student communication. - E-mail services; - Students acquire their course keys and information via Wilma; - Student's guardians can monitor attendance in real time and send and receive messages, see grades; - Full integration with student data services, their diplomas, grading and all class schedules and timetables; - Primary communication and data management tool in Sakky.	Smartphone app limited in functionality.
MS Teams - Office365 (used in Finland and Germany)	- Full integration into MS Office Suite; (Word/Excel/Windows Explorer) - Includes file share per „Team“; - Educational plugin like tasks, feedback and marks; - Videoconference incl. messenger; - Worldwide connectivity (Office 365 Account, if enabled); - App and desktop client for all mobile devices.	Office 365 has in Germany until today a lot of open privacy concerns. Its use is not yet prohibited.

→ Mainly used digital tools for materials, supportive offers, games, etc.

Application	Description / Subject	Pro	Contra
Oncoo (used in Germany)	Oncoo is used to structure some methods in the classroom. Possible uses are digital map queries, the placemat method and a target for opinion polls.	- Tool for start of lesson or motivation. - Tool for feedback; - Free of charge; - Simple handling for students and teachers.	- If there are many answers from the students or if the answers are duplicated, Oncoo does not pre-sort or sort them out. - Data protection given.
Planet eStream (used in Finland)	Used for making videos and video exercise returns by students and instruction videos / screen capture videos by teachers.		Requires a lot of bandwidth.
Hot Potatoes (used in Finland)	Used for creating simple exercises and crosswords (also embedded in Moodle).	Exercises are simple and mechanical.	Exercises cannot be edited without the Hot-Potatoes app.
Kahoot also via browser (used in Finland and Germany)	Feedback tool; tool for testing of knowledge and good starting point for collecting arguments.	- Fast feedback; - Applicable in many subjects.	Data protection given.
Quizlet also via browser (used in Finland and Germany)	Tool for testing of knowledge („learning cards“), good for training of vocabulary, can be used differently, too.	- Lots of opportunities to practice in a playful way; - Query "direction" adjustable.	- Free of charge version with ads. - Data protection given.

**Note:** German data protection is a very important issue and is strongly defended against the commercial interests of business. Particular attention is paid to the data protection of the youth, meaning pupils and students. Thus, certain software that is used by adults in a private or business environment may not be used in the protected area of the school from a data protection point of view and violates the much stricter data protection regulations there. See also: <https://www.landesrecht-bw.de/jportal/?quelle=jlink&query=DSG+BW&psml=bsbawueprod.psml&max=true>.



### 3) Criteria for successful BYOD in VET

- All students should be kept busy, **no idle periods**

Note: A certain level of waiting for turn etc. may take place. Additional side tasks should be assigned for those who are waiting for their part in the task, if waiting periods become an issue.

- **MUST** in technology: **working infrastructure & net stability**
- General rules:
  - Pupils **know the technical platform / apps** or the platform / app is easy to understand (e.g. quizizz.com)
  - Pupils are **digitally networked** with each other and can reach each other digitally (messenger or file exchange)
  - Approach: "it needn't be a purely collaborative tool for the use in classroom" (it needn't be Sharepoint or GoogleDocs). Other less collaborative tools such as "moodle" also do the trick.

Note: Possible privacy issues may sometimes be a concern.

Solutions:

- signed letter of acceptance,
- school e-mail address,
- chats / answers / documents to be exchanged via data save tool, e.g. Moodle

- BYOD lessons are **embedded in practical examples** including the introduction and story line of the lesson.
  - key question from the student: "Why am I doing this (... today's lesson)? / Where will I need it later?"

Note: A proper introduction and tying the subject into student's sphere of experience/field should absolutely be included, situations and work tasks in their profession to be – motivation for partaking!

- The **teacher's share of speech is balanced and minimized**, not a pure self-organized learning process.

Note: Preferably in the way that the teacher gives instructions and explanations in the beginning, after which the process continues with students in the lead and with minimal teacher partaking required. Then again at the end of the lesson the teacher should prompt feedback and reflection on the task (see below).

- **Expedient use** of BYOD
  - e. g. either teacher **or** software/audio recording pronounces an English word, not using both methods
- **Securing results:** discuss results with the class at the end of the lesson or compare results with each other in groups or ...  
Note: A lesson reflection requires at least a feedback as to how it went. Sometimes results can't be analysed thoroughly at the end of a lesson and need to be given space in another lesson.
- The **correct results should be permanently accessible** for and documented by the students after the lesson (if necessary, save a screenshot of the results on the learning platform).

Note: Moodle is effective for this, on some other platforms the saving of data may cause a problem. Nevertheless, possible correct answers etc. should be made available for any student at any time.

#### Insider tip:

- Designing the learning process game-like or giving it a competition character can help with motivating pupils. Even just suggesting some friendly race to the finish may work. Students are used to playing games on their mobiles and feel at ease playing a 'real-life' game in the same sense.



#### 4) Evaluation form for BYOD in VET

##### Evaluation of your lesson!

Please help us to create great school lessons for you by answering the following questions:

	yes, absolutely	sure, a bit	rather less	no
The digital tools simplifies the subject for me:				
With the digital tools, learning is fun:				
With the digital tools, learning is varied:				
The digital work simplifies communication between students:				
The digital work simplifies communication with the teacher:				
The digital tool helps me to understand the topic of the lesson better:				
The digital work helps me to support my learning process:				
Do you prefer to learn with the help of digital tools (instead of working with printed sheets)?				
Did you understand the lesson faster with digital tools than with printed work sheets?				

What should be improved in this lesson concerning the materials and tools used?

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Should your teacher use more digital tools in your lessons? Why?

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**Results** of all digital lessons, held in this project, showed a clear tendency:

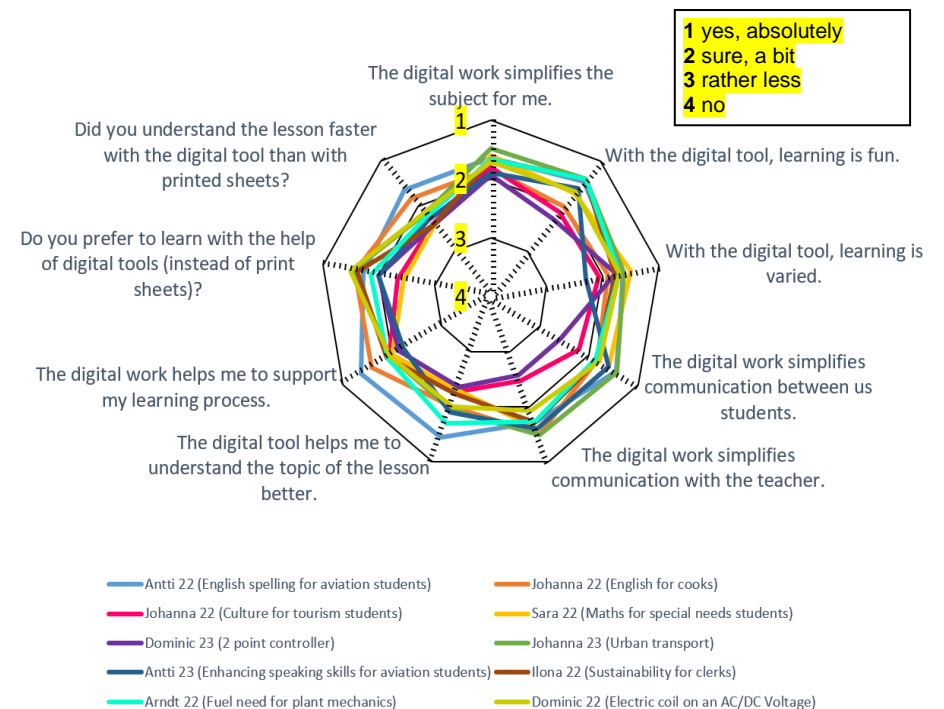
→ The digital work simplifies communication and varies learning.

→ No improvement of the lessons needed (mostly).

→ A very clear NO to an extensive use of digital tools in school lessons - several students even wished for more use of paper worksheets.

Explanation for these evaluation results given by students:

- Using a mobile phone for private reasons does not mean necessarily that the use of mobile phone in school makes the lessons more attractive or learning easier.
- Extensive use of digitalisation in the classroom may overwhelm the students as they often use only the basic functions of their mobile phones.
- Vocational students nowadays are still used to work with paper worksheets in the classroom because they learned to work with them extensively in primary, comprehensive, secondary and high school.





## 5) Two good-practice examples for lessons BYOD in VET

*Teacher's name: Antti Heikkinen*

**Topic: Special characters in English (for Aviation mechanics 2nd year students)**



**Aim of lesson:** To learn special characters in English alphabet and to practice using them verbally over the phone or voice messages.

**Description:** In aviation mechanic duties, as well as in most any jobs requiring specific parts or dealing with shipments or warehousing, knowledge of special characters and symbols is often required. Order numbers, part codes, catalogue numbers, registration numbers or service bulletin or task guides referring to legislation or publications and such often include them. These may often also have to be used over the phone or radio instead of in writing only.

**Time:** 45 minutes

1) Introduction into topic (description of (learning situation) and problem/difficulty/challenge)	Attachments / Remarks
Introduction and overview on situations where special characters will be required in real life situations; order, parts, or registration numbers.	
2) Introductory Task(s)	
Version 1: <ul style="list-style-type: none"> <li>- passwords or file paths etc. given over the phone</li> <li>- the alphabet and special letters in English are reviewed by the teacher or pre-arranged presentation e.g. a video</li> <li>- pronunciation of the individual letters/character names, verbally or via audio track/website exercise</li> </ul>	Version 1: QR code made available for students to listen to the pronunciation again <a href="https://www.deepl.com/">https://www.deepl.com/</a>
Version 2: Students scan a QR code and individually listen to the alphabet and special letters in English.	Version 2: SOL (headphones required)



<p><b>3) Work phase(s) - individual, tandem and/or group work</b></p> <ul style="list-style-type: none"> <li>- All students receive a personal piece of paper (alternatively using a QR code) with an individual message containing a special character sequence (but the messages are numbered) -</li> </ul> <p><u>Note:</u> if the number of students is unequal, the teacher may need to be involved. The message is such as could have been left in an audio message from a client/partner in real life and can be adapted to different situations/fields.</p> <ul style="list-style-type: none"> <li>- Each student must then dictate/record their individual message including the character string into their own BYOD device as a voice message (without text recognition). The number of the message is also dictated. ("This was Message number: xy".)</li> <li>- When ready, each student sends its audio message to a neighbor student in the class as instructed by the teacher. Or alternatively, previously randomized partner in the class (via the school's communication/learning platform).</li> <li>- The recipient must listen to the message received and hand-write the message/sequence of characters on paper.</li> <li>- Then the same student dictates his message into the smartphone - with text recognition.</li> </ul>	<p>Mobile phone</p> <p>QR code reader (online scanner, e.g. <a href="https://webqr.com/">https://webqr.com/</a>)</p>
<p><b>4. Securing knowledge (checking of results and learning progress) incl. feedback/evaluation (by teacher, classmates, internet)</b></p>	
<p>At the end, the students compare the handwritten messages and the messages recognized by the BYOD (speech recognition) with the original message (based on the number)</p>	<p>Mobile phone</p>



*Teacher's name: Ilona Wildemann*

**Topic: Sustainability (for industrial management assistants)**

**Aim of lesson: Students know the dimensions of sustainability and can give concrete examples.**



**Description: Students learn about the three dimensions of sustainability and learn relevant vocabulary. Students design a mind-map in groups with giving concrete examples what (their) companies do concerning sustainability. Students present their results in class.**

**Duration: 45 minutes**

1) Introduction into topic (description of (learning situation) and problem/difficulty/challenge)	Attachments / Remarks
<p><b>Appetizer:</b> Online-Puzzle with a photo showing the dimensions of sustainability</p> <p><b>Question:</b> What do you know about sustainability?</p> <p><b>Situation:</b></p> <p>You work for an international company.</p> <p>Your boss Sheila wants you to prepare a mind map on the topic the <b>Three Dimensions of Sustainability</b> with concrete examples what companies can do.</p>	<p><a href="https://www.jigsawexplorer.com/">https://www.jigsawexplorer.com/</a></p> <p><b>Picture 1</b></p> <p>Text to be put on worksheet or in moodle course</p>
2) Introductory Task(s)	
<p><b>Task 1 Work individually</b></p> <p>Scan the codes and learn about the dimensions of sustainability.</p> <p>→ You have 10 minutes time</p>	<p><a href="https://Quizlet.com">https://Quizlet.com</a></p> <p><a href="https://Learningapps.org">https://Learningapps.org</a></p> <p>Clock/Timer: <a href="https://www.classroomscreen.com/">https://www.classroomscreen.com/</a></p>





<p><b>Links:</b> Quizlet Wordlist Sustainability: <a href="https://quizlet.com/bhfmtf?x=1qqt&amp;i=5dgo">https://quizlet.com/bhfmtf?x=1qqt&amp;i=5dgo</a> LearningApps: Sustainability: <a href="https://learningapps.org/watch?v=psavpeqx322">https://learningapps.org/watch?v=psavpeqx322</a></p>	<p><b>Wordlist</b> <b>Game content</b></p>
<p><b>3) Work phase(s) - individual, tandem and/or group work</b></p>	
<p><b>Task 2 Work in teams</b></p> <ul style="list-style-type: none"> <li>- Design a mind map on the three dimensions of sustainability. Give concrete examples what companies do!</li> <li>- Design a mind map with your own digital device.</li> </ul> <p><b>Task 3 Work in teams</b></p> <p>Upload your mind map on the digital pin board. → You have 15 minutes time.</p>	<p><a href="https://map.kits.blog/">https://map.kits.blog/</a> <a href="https://www.taskcards.de/#/home/start">https://www.taskcards.de/#/home/start</a></p>
<p><b>4) Securing knowledge (checking of results and learning progress) incl. feedback/evaluation (by teacher, classmates, internet)</b></p>	
<p><b>Solution of situation:</b> Present your mind map in class!</p>	

Watch our videos on the working with and feedback to the BYOD in VET lessons!  
→ <https://zsl-bw.de/Lde/11143373> (video from ZSL, Germany)  
→ <https://vimeo.com/799023787/b03b6826cb> (video from Sakky, Finland)



## 6) Digital projects at ZSL, at Sakky and in other countries

### Lernen trotz(t) Corona at ZSL

In the second half of 2020, the "Lernen trotz(t) Corona" (Learning despite (defies) Corona) project was launched being financed by the Baden-Wuerttemberg Ministry of Education, Youth and Sports. The project is carried out by the Centre for School Quality and Teacher Education (ZSL) Baden-Wuerttemberg in cooperation with interested teachers.

The aim of this project is to offer "ready to use" Moodle courses for download. These Moodle courses offer quality-assured and curricula-compliant digital courses for different types of school, subjects and topics.

All Moodle courses are "ready-to-use" and designed in such a way that they depict complete teaching sequences for subject specific teaching for at least two weeks. The Moodle courses have also integrated external exercises, such as H5P: <https://h5p.org/>.

The project is currently running under the project name: Moodle-Moove (<https://moodle.moove-bw.de/moodle/> and is in the sixth phase).

### Project tabletBS.dual at ZSL

At the beginning of the school year 2016/17, a pilot project for the use of tablets in dual training started with 14 vocational project schools in the vocational fields of office management clerk, motor vehicle mechatronics technician and mechatronics technician. As part of this project, the different uses of tablets in teaching vocational skills are to be tested. For this purpose, teaching units are developed, the implementation of which is expected to add pedagogical value (e.g. with regard to motivational aspects, greater self-control, greater media competence, greater cooperation and greater cognitive complexity). Involving the training companies opens up additional opportunities for learning location cooperation.

Nowadays, the project includes ten dual training occupations and involve up to 52 schools. In this way, around 10,000 trainees are involved in the project since 2016.

(See also: [https://tabletbs.kultus-bw.de/Lde/Startseite/Schulversuch/tabletBS\\_dual](https://tabletbs.kultus-bw.de/Lde/Startseite/Schulversuch/tabletBS_dual))dig

### Digital teaching and learning at Sakky

The digital development projects currently underway at Sakky can be roughly divided into the development of the staff's digital skills and operating culture, as well as the development of learning environments and their contents. Project funding is also used to develop the use of 3D technologies and make technology acquisitions.

The aim of the projects is to support learning and increase the competence of the personnel by developing e.g. teaching and digital learning environments that consider the possibilities of new technology in a versatile way (e.g. image, video, gaming, virtual environments, 360, 3D, 5G, Open AI...). In addition, operating models, training modules and simulations have been built, such as virtual learning environments that resemble working life (Wonda VR).

New educational technology products, training products, software and hardware have been acquired for the sectors. Two physical spaces, i.e. Digitori (digi market), have been equipped to support the formation of a permanent culture of experimentation and as a common learning and testing environment.

### Emergency remote teaching in Ukraine

Ukraine switched in 2022 due to the war situation to emergency distance learning, which Ukrainian schools had already implemented during the COVID-19 pandemic.

The main platform for distance learning in Ukraine is All-Ukrainian Online School (<https://lms.e-school.net.ua/>), which offers classes in all subjects for students in grades 5 to 11. For easier coordination, the online lessons are integrated into an interactive all-Ukrainian online lesson plan that includes materials for students in grades 1 through 11.

In addition to the All-Ukrainian Online School, there are other online materials in Ukraine, one example is the NUMO online kindergarten with video courses for children aged 3 to 6 years - a collaboration between UNICEF and the Ukraine Ministry of Education and Science.

VET institutions are advised to carry out the theoretical part of their lessons online and to postpone the practical part until after the end of the war.

Moreover countries around Ukraine offer their digital learning materials in Ukrainian language, such as Estonia, Finland, Poland and Romania.