

Feasibility Study VET-LSA

A comparative analysis of occupational
profiles and VET programmes in
8 European countries

Austrian National Report

**Lorenz Lassnigg, Mario Steiner, Stefan Vogtenhuber (IHS)
Elisabeth Riebenbauer, Peter Slepcevic (University of Graz)**

Research Report

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eQUIHS
employment • qualification • innovation

**Institut für Höhere Studien (IHS), Wien
Institute for Advanced Studies, Vienna**



Contact:

Lorenz Lassnigg
☎: +43/1/599 91-214
email: lassnigg@ihs.ac.at

Remarks

To set up an international Large Scale Assessment of Vocational Education and Training (VET-LSA), a Feasibility Study with experts from all participating countries was developed to investigate whether a comparison in selected vocational areas is feasible and to agree on a basis for comparison. The National Report at hand is the result of the Austrian cooperation in this project, which was initiated and managed by the Soziologisches Forschungsinstitut (SOFI) at the University of Goettingen. The following countries participated in the Feasibility Study: Austria, Denmark, Finland, Germany, Norway, Slovenia, Sweden and Switzerland.

See:
<http://www.vet-lsa.uni-goettingen.de>

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Lorenz Lassnigg (IHS)

1. National VET system: institutional factors impacting VET

1.1. VET as part of the educational system

VET is a strong and integrated part of the Austrian educational system. About 80% of students at the upper secondary level are enrolled in VET-programmes. There are three main types of programmes at upper secondary level:

- apprenticeship programmes in enterprises, including a part-time compulsory VET school (2-4-yrs.)
- full-time intermediate secondary VET-schools (1-4-yrs.)
- full-time upper level secondary VET-colleges (5-yrs.)

Beneath those main types there are separately organised programmes for the health professions and for agriculture and forestry.

The diagram shows the position of the VET-programmes in the system and the orders of magnitude of enrolment. The transition into VET is organised in a specific way, comprising a two-step procedure: At grade 9, within the range of compulsory schooling the transition into full-time secondary VET-schools and colleges takes place. One year later, after completion of compulsory schooling at grade 10, the transition to the apprenticeship programmes takes place. The inflow to apprenticeship partly comes from full-time VET-schools, partly from a specific preparatory school, and partly from compulsory schooling by young people who have missed some grades.

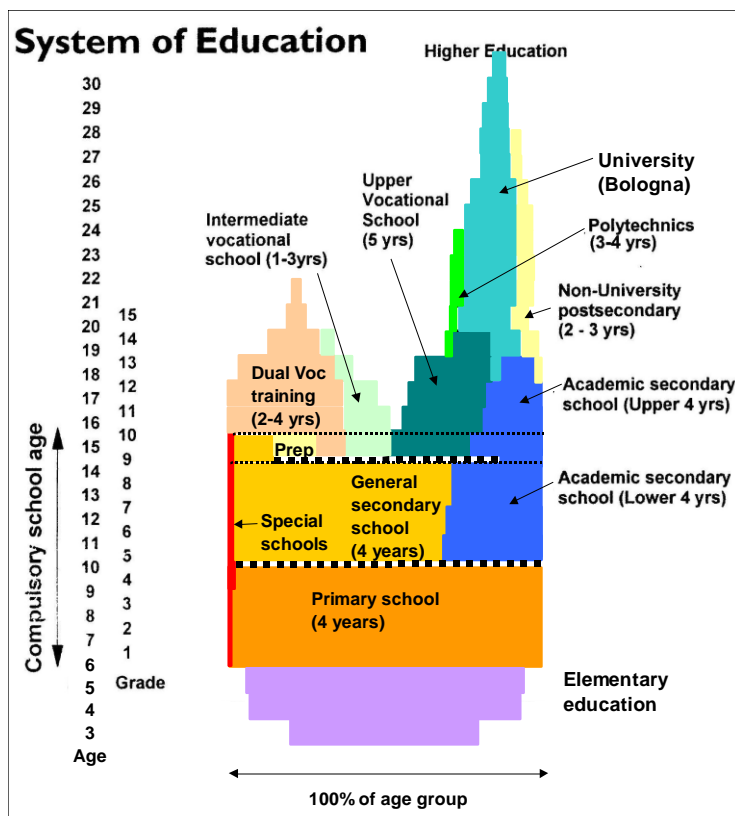
At the upper secondary level, about one third of students are enrolled in apprenticeship, one third in the upper-level full-time VET-colleges, about 10% in the intermediate full-time VET-schools, and about 20% outside VET in the upper secondary academic schools.

A small range of less than 10% do not enrol in any alternative, and due to lack of apprenticeship places in enterprises, young people who cannot find a traineeship are offered specific programmes to be trained in institutional settings, based on a specific law (Auffangnetz, Jugendausbildungssicherungsgesetz-JASG). There have been several changes in these settings, in principle a transfer in enterprise based apprenticeships is aimed at, however, by now the whole programme can also be provided in the institutions. In addition, a high proportion of apprenticeships in

enterprises has been subsidised by public support. An important player related to the apprenticeship system is the public employment service (AMS), which runs a separate exchange for the apprenticeship market. The figures on the apprenticeship market are important indicators for policy measures, as the „security net“ (Auffangnetz) is directly related to the unemployment figures at the apprenticeship market.

During recent decades the upper level VET colleges have expanded very much (student numbers have risen almost 5-times since 1970, and more than doubled since 1990), whereas apprenticeship and the intermediate VET-schools have rather stagnated.

Figure 1: The system of education in Austria



Source: own picture.

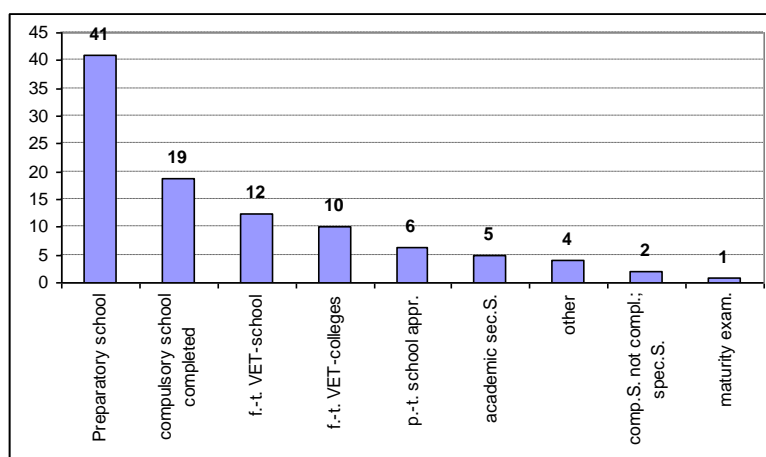
- Are there general requirements for entering VET programmes in terms of certificates?

There are no formal requirements for an apprenticeship programme except the fulfilment of compulsory schooling. However, the start of an apprenticeship requires a contract with an accredited enterprise. The selection of apprentices is due to the

decision of the enterprise. If a contract is successfully signed, the apprentice has to visit the compulsory part-time VET-school.

Figure 2 shows the qualifications of entrants into apprenticeship. One can see that de facto the minimum requirement is completion of compulsory schooling, and about one fourth have visited a full-time VET school/college or the academic secondary school before (remember the two-step transition system). Different from Germany there are almost no apprenticeship beginners that have completed a maturity examination. Access to apprenticeship is mainly directly after compulsory schooling (about 73% or training of entrants into apprenticeship (2002/03).

Figure 2: Previous school of beginners are 15/16-years old, almost 90% are maximum 17y.)



Source: Schneeberger/Nowak 2008¹, own picture.

Access to full-time VET schools and colleges requires the successful completion of grade 8 of compulsory schooling, and there are additional requirements concerning the achievement levels in main subjects.² Grossly the upper level VET-colleges require good grades, and the intermediate level VET-schools require average grades. There are opportunities to pass an examination, if the grades are too weak.

- Does VET in general provide access to Higher Education (legal basis, transition quotes)?

Up to now, young people who have passed a maturity-examination, are entitled to access to university. The VET-colleges are providing general access to Universities,

¹ Schneeberger, A., Nowak, S. (2008), *Lehrlingsausbildung im Überblick - Strukturdaten und Ergebnisse europäischer Erhebungen* (Edition 2008), ibw-Forschungsbericht Nr. 142, Wien.

² See: http://www.berufsbildendeschulen.at/en/glossar/a/aufnahmebedingungen_fuer_bms_und_bhs.html

similar to the academic upper secondary schools, by a maturity-examination (Matura). Polytechnics (Fachhochschule) have additional entry requirements. About 40% of university entrants have completed a VET-college before, as have more than 50% of entrants of Polytechnics.

Apprenticeship and the intermediate VET-schools do not provide access to universities. Some quite successful bridging mechanisms have been created by the opportunity of a vocational maturity-examination (Berufsreifeprüfung), which can be taken at upper secondary schools. More recently support has been developed for preparation to this examination in parallel to apprenticeship programmes. This is in the stage of implementation at the moment. There is lack of information about this new path to higher education. From the intermediate VET-schools there is also a small scale opportunity to get the certificate of VET-colleges (Aufbaulehrgänge).

1.2. Policy governance of national VET system

- Who is in charge of introducing and developing VET programmes?

The procedures of introducing and developing VET-programmes are rather complex, and they differ between apprenticeship and full-time VET-schools/colleges.

In *apprenticeship* the basic elements are 250 apprenticeship occupations³ which are legally regulated and administered by the ministry of economic affairs. The main basis is the Vocational Training Act (Berufsausbildungsgesetz). The members of the Federal Advisory Board on Apprenticeship (Bundes-Berufsausbildungsbeirat, BBAB), where the social partners are represented, are advising the ministry on matters concerning apprenticeship training (e.g. introduction of new apprenticeships etc.) In parallel the part-time school for apprentices is administered by the ministry of education. In addition, a set of regional bodies and authorities, including the regional economic chambers, is implementing the decisions. A decision about new occupations is a rather complex procedure. More recently, more flexible solutions that allow for combinations of occupations and modularisation have been amended. The provision of apprenticeship training finally rests on the decision of an accredited training enterprise.

In *full-time VET-schools/colleges* the Federal Ministry of Education is in charge of administration, which also has to cooperate with the regional authorities. The programmes are established by federal law (Schulorganisationsgesetz), and there are some opportunities at the school/colleges level, for profiling the programmes. There

³ See: <http://www.bmwfj.gv.at/NR/rdonlyres/D0C9E3B6-16F6-4533-93AF-3970E939932F/0/lehrberufslistestandjuli2008.pdf>

are federal framework curricula in place for the programmes, which can be changed by the minister. In practice there are complex procedures in place for periodic renewal of the curricula (about once a decade).

- Organisation of VET at the national/local level?

Basically VET is regulated at the federal level, and there are complex structures of responsibilities for provision at the local level. *In full-time VET schools/colleges* a regional education authority (Landesschulrat) is the main implementing organisation. There are about 500 schools, in most cases the intermediate and upper level schools are combined at the same location (however they are separate schools).⁴ In apprenticeship training the regional and local economic chambers are running an administrative unit (Lehrlingsstelle) for the implementation of the enterprise training. The part-time VET school (about 160 schools) for apprentices is also administered by the regional education authority (Landesschulrat) in cooperation with the regional governments (Landesregierung).

There are also separate bodies for the final examinations (Lehrabschlussprüfung) of the enterprise part of training, based on complex federal and regional legal regulations.⁵

- Description of the relationship between central and local institutions.

Austria has one of the most complex systems of school governance, which encloses different channels for the teaching/training personnel, school maintenance, and provision of the running costs. In full-time VET-schools/colleges the systems is comparatively tight, with a directorate of the ministry of education, that is organised by the main fields of education (engineering, business, services) as the main governing unit.

In apprenticeship the system is much more complex. The enterprise part and the school part are governed by different systems under the regulation of different ministries. Thus there are coordination problems (e.g., when a new training occupation has been created, the education ministry is responsible for the development of the school curricula).

The provision of apprenticeship training takes place mainly in small enterprises (about 40.000 as compared to about 700 schools), where only single or very small

⁴ See: http://www.statistik.at/web_de/statistiken/bildung_und_kultur/formales_bildungswesen/schulen_schulbesuch/index.html.

⁵ See: <http://www.wkw.at/docextern/abtbipol/AllgemPrford.htm>.

groups of apprentices are trained. Thus the training is mainly on the job, and only a very small minority of enterprises employs separate facilities for training (e.g. full-time trainers, or training workshops). Instruction is mainly given on the job by fellow workers or part-time trainers who are running their productive tasks beneath instruction.

- Who is in charge of financial decisions in VET (governmental or private financing)?

Full-time VET-schools/colleges are financed by the federal budget in a classic bureaucratic manner. The regional authorities are implementing the budget.

In *apprenticeship* the main part of financing rests on the enterprises (foregone productivity) and the apprentices (foregone incomes). Past studies have obtained on average small net costs with the enterprises. A substantial amount has been subsidized by public budgets, mainly by the public employment service (AMS). The part-time school is financed cooperatively by the federal and the regional budgets.

- Who is involved in decision making processes for developing and implementing VET-programmes (e.g., social partners)?

The responsibilities for the taking of decisions are clearly regulated, however, the process of development of new programmes is mainly informal and differs very much from case to case, and also between the different fields and sectors.⁶

In full-time VET-schools/colleges a periodic update of curricula is performed, with the ministry as the leading force. The process is run by task-forces which are working differently in the different education domains. Experienced practitioners are main contributors to those processes, in some field formal evaluations are utilized, in others broad workshops, including enterprise representatives are used.⁷

In apprenticeship for each occupation there is a basic content regulation (Berufsbild). The main player is the responsible department in the ministry of economic affairs. There have been different initiatives and procedures for the development of new occupations in recent years, some originating from the ministry, others from the advisory body, or broader political or social partner initiatives. Support with the

⁶ Lassnigg L / Markowitsch J, eds. (2005) *Qualität durch Vorausschau. Antizipationsmechanismen und Qualitätssicherung in der österreichischen Berufsbildung*. Innsbruck-Wien: StudienVerlag.

⁷ See: Steiner M (2005) *Qualitativ-praktische Aspekte der Antizipation*. In: Lassnigg/Markowitsch, 123-178.; Aff J / Dorninger C / Schneeberger A (2009) *Ingenieure und Kaufleute 2008. Eine Übersicht von Arbeiten zur Qualifikationsforschung*, in: Lassnigg L et al, eds. *Öffnung von Arbeitsmärkten und Bildungssystemen*. Innsbruck: Studienverlag, 316-328.

development of the regulations is given by applied R&D, mainly the educational research institute of the economic chamber (IBW).⁸

1.3. Quality monitoring of VET

- *Are there national standards for quality monitoring in VET?*

In the *full-time VET-schools/colleges* sector a new system of quality development and quality assurance is currently under construction (QIBB).⁹ This system aims at the development of standards in the main subjects. Up to now the main procedures of quality monitoring are the evaluation of students by the teachers, without objective knowledge about standards.¹⁰

In the apprenticeship system there exists a procedure for the accreditation of an enterprise as a training enterprise (Feststellungsverfahren).¹¹ The local unit of the economic chamber (Lehrlingsstelle) is responsible for this, and the main part of the procedure is a site visit by responsible persons that assess whether the enterprise site is qualified for training in a certain occupation. A second level of monitoring is the final examination which is run by external examination boards (Lehrabschlussprüfungskommissionen). Members of the boards are practitioners in the respective occupation.

- *Who is in charge for quality monitoring in VET?*

There is a system of school inspection covering *all kinds of schools*. The regional authorities are mainly responsible for the inspection procedure (Landesschulinspektoren). This system is under discussion, as it is lacking oversight and the power of imposing consequences based on results of inspections. There are proposals to transform the inspection system into a kind of development agency. VET-colleges mostly have boards including regional enterprise representatives.

In the enterprise part of *apprenticeship training* there is no regular quality monitoring of training. More recently there are statements by the social partners calling for an improved quality monitoring. However, this would contradict to some extent the problem of lack of training positions. During recent years, quality issues have rather been postponed, in order to create as many training places as possible. The proportion of apprentices passing the examination is sometimes used as an indicator of quality monitoring (passing rates are similar to Germany, about 85%).

⁸ <http://www.ibw.at/>.

⁹ See: http://www.qibb.at/en/home/info/mission_statement.html.

¹⁰ PISA results indicate low correlations between the teacher's marks and the test-results.

¹¹ See: <http://www.help.gv.at/Content.Node/96/Seite.960400.html>.

- What is the average level of professional expertise of VET teachers and trainers?

In the VET-school sector there are different kinds of teachers and trainers: those for the general subjects, those for the „theoretical“ VET-subjects, and those for the „practical“ VET-subjects. Teachers of general subjects are equally qualified as those for the same subjects in the general and academic schools; teachers of VET-subjects are required to have some years of practical experience in the world of work outside schools as a main source of expertise, and in addition there are different education and training requirements, ranging from university studies to completion of apprenticeship training and subsequent master programmes. The qualification requirements for theoretical subjects are normally higher than for practical subjects, and there are also differences between fields of study. In business education there is a teacher training programme at universities (Wirtschaftspädagogik), and there are in-service teacher training programmes at the teacher training institutes (former Berufspädagogische Akademie). Many teachers are also employed outside school, or running their own enterprise.

A constant issue of discussion has been the training of the trainer in the enterprise part of apprenticeship. There is a part of the procedure for being allowed to run a business in Austria (Gewerbeberechtigung) that refers to some knowledge in training (Trainers Examination - Ausbilderprüfung).¹² There are also regulations that require a certain numerical relation ‘trainers to trainees’ in an enterprise. However, those requirements are very loose, and have been further reduced to some extent, in order to allow more enterprises to provide training (e.g., in the new economic sectors of ICT and the like). In Austria apprenticeship training is mainly provided by small enterprises, with frequently one apprentice only. Consequently, full time trainers and separate training infrastructures are available in a very small proportion of training enterprises only. Most often the apprentices are trained by fellow workers without loss of their productivity.

1.4. Organisation of VET programmes according to national occupational profiles and traditions

- What are the most popular VET programmes?

As already indicated the most popular VET programmes are the VET colleges which provide a double qualification of occupational/professional training and academic education for access to higher education. Figure 3 shows this development. Since

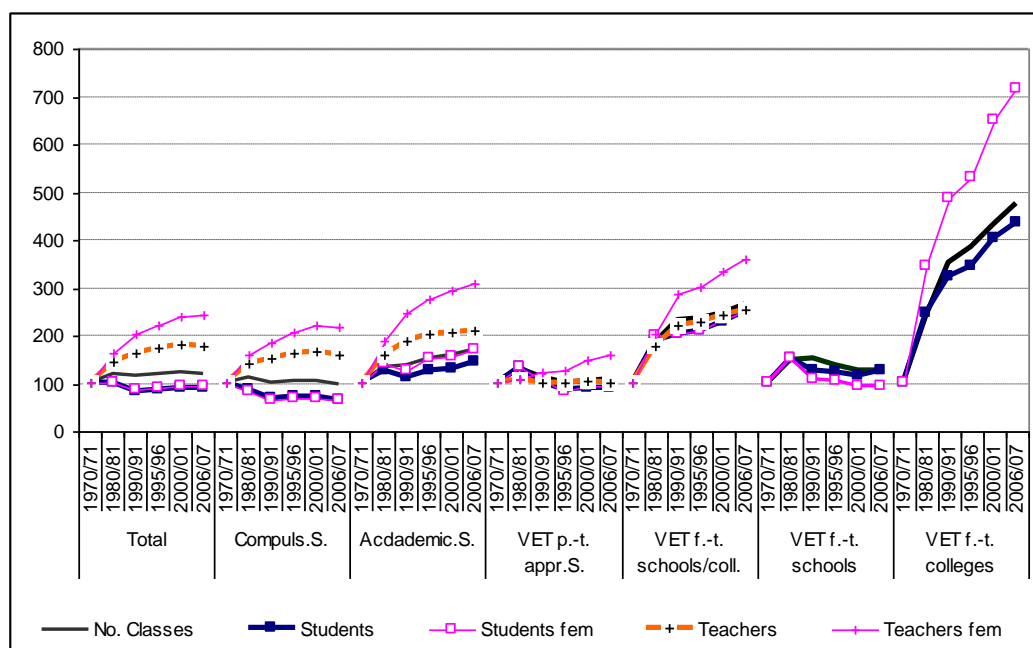
¹² The examination is part of the masters examinations (Meister- oder Befähigungsprüfung), and several professional examinations are substitutes for this. 40 hours training in pedagogy, law, and issues of apprenticeship training are recommended as a preparation.

1990 the medium level programmes (apprenticeship and full-time VET school are stagnating).

Young men choose more frequently apprenticeships (almost 50%), young women choose more frequently full-time schools at different levels. Within schools men choose more frequently programmes in engineering, construction, etc., whereas women choose business, service, and education programmes (Figure 4).

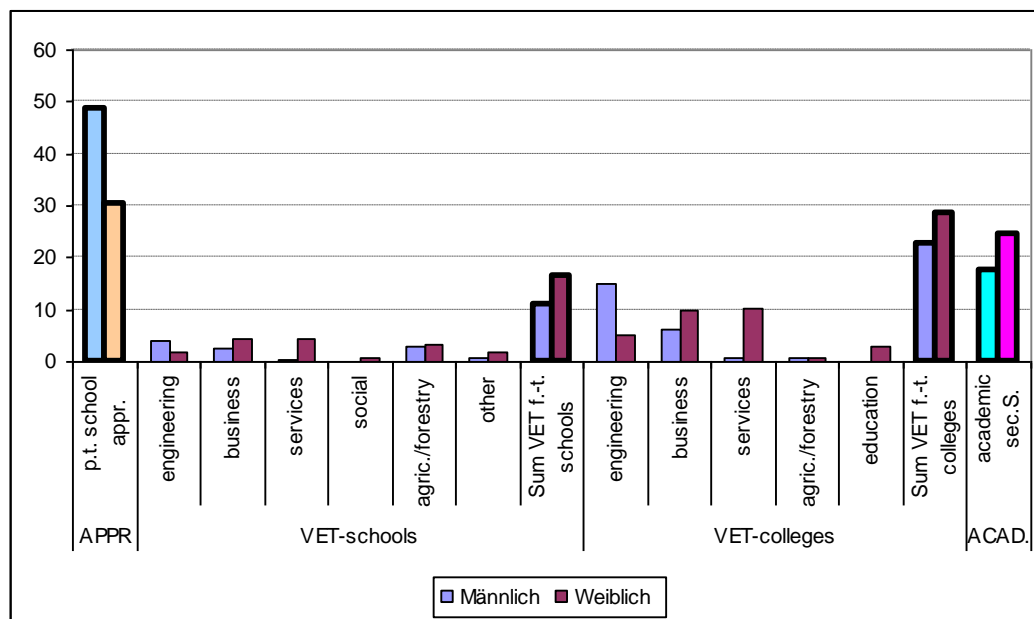
Among the about 250 apprenticeship occupations the distribution is rather concentrated, in particular among women. 60% of male apprentices are trained in the 20 most frequent occupation, and this holds for 70% of female apprentices (figure 5). As in full-time schools, the distribution of young men and women among the occupations is very different, men choosing engineering and car related occupation, and women business and service related occupations.

Figure 3: Index of indicators per types of schools in Austria 1970-2006

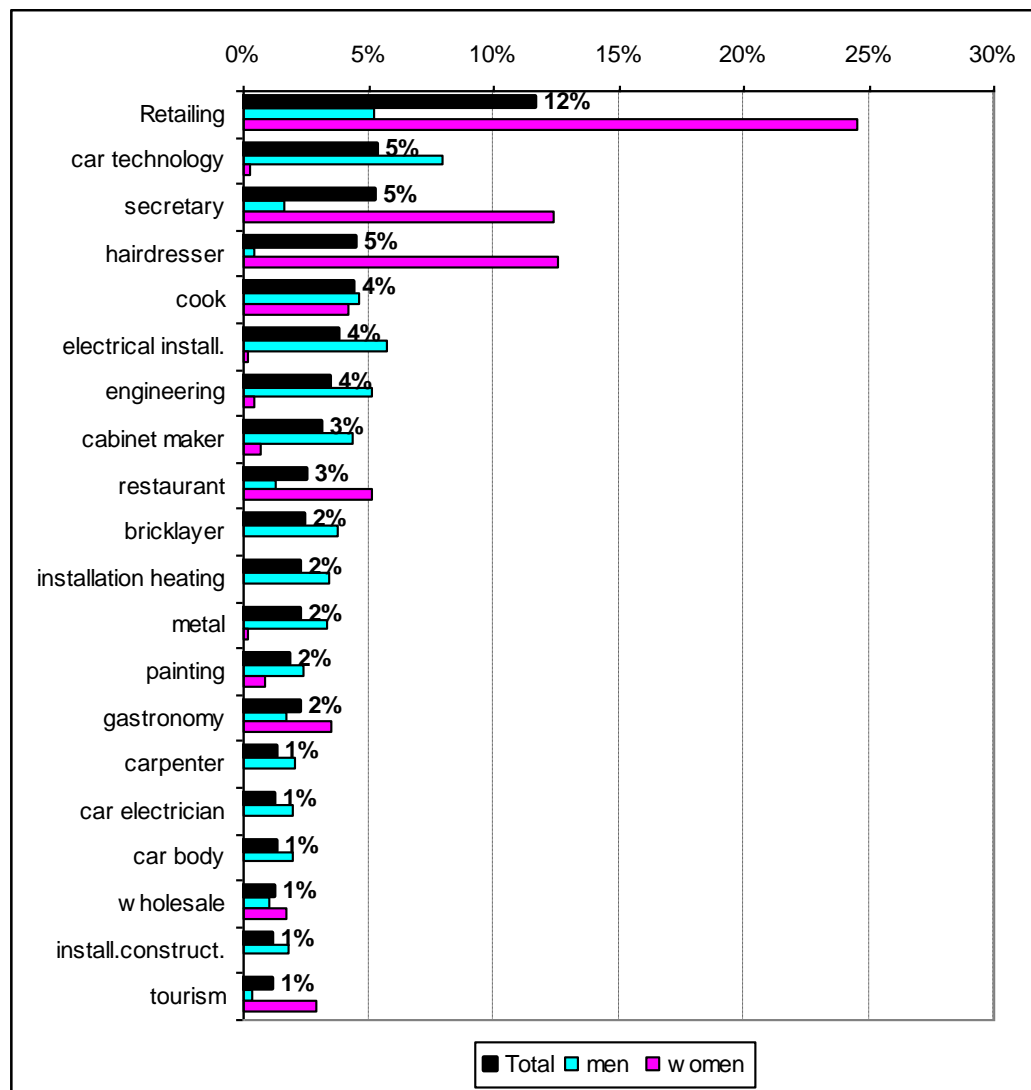


Source: own compilation based on different statistics.

Figure 4: Distribution of students at grade 10



Source: Schneeberger/Nowak 2008, own picture.

Figure 5: The 20 most popular apprenticeship occupations

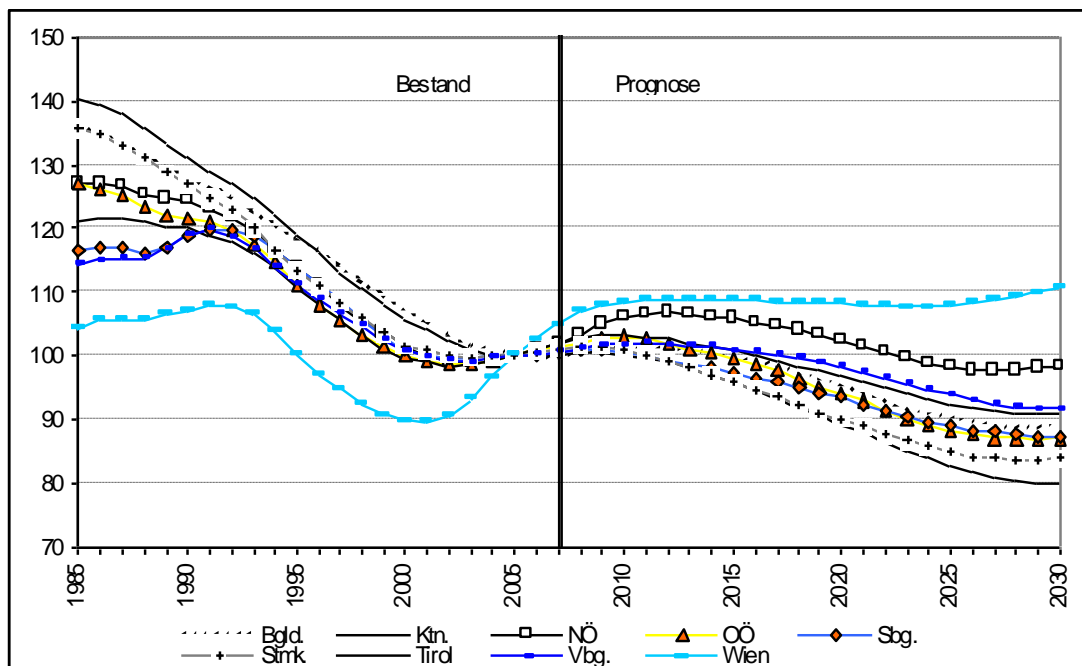
Source: Schneeberger/Nowak 2008, own picture.

- *What are the most important changes within the past ten years?*

The system as such has not changed very much within the last ten years, however, more recently some important new directions have been or are being taken, which might lead to major changes in the near future. Basically the demographic development brings about lower figures of young people, which are only changed into a positive direction to some extent by immigration. However, there are big regional differences with respect to immigration. Mainly in Vienna the number of young people is projected to grow or being stable, whereas the figures of young people in the other regions are projected to decline. This development is setting constraints on education and training, first because there are fears of bottlenecks of trained people in the future, and second because the education and training providers

are competing with each other for pupils in order to hold their resources and infrastructures at given levels.

Figure 6: Demographic projections of 15-29-years old people until 2030 by Austrian regions



Source: Statistics Austria, own picture.

On this background various changes in debates and perceptions can be observed according to education in general, and to VET in particular:

- A first point is, that the persisting problems on the apprenticeship market are increasingly seen as signs for structural problems (and not only as coincidental, as in the past), that call for solutions. The policies of subsidisation of apprenticeship places are increasingly less seen as a sustainable solution. Structural issues have been put on the agenda. One is a search of alternatives for young people who do not qualify for apprenticeship, another is the call for substantial improvement of compulsory schooling, and a third is to provide the opportunity of a vocational maturity exam in parallel to apprenticeship very recently in order to be attractive for more ambitious young people.
- Modularisation is developed as a new approach in apprenticeship, in order to create a new structure of occupations by a combination of basic modules, main modules and special modules. This process is very much in the beginning.
- The two-step transition into apprenticeship is another area of concern, because the first year of full-time VET-school/colleges has very different conditions to the subsequent ones as a transition year. This problem affects in

particular the full-time VET-schools, which loose many of their first year students to apprenticeship. That affects the learning culture, and makes that year very much of a screening year also.

- The quality initiative QIBB in full-time VET schools/colleges is another important change, which tries to improve the teaching-learning processes in this sector, and to implement outcome-orientation by the development of standards. This initiative fits into a broader concern about outcome orientation, which has come up with the initiative to develop a national qualification framework.
- Recently a political consensus about a “guarantee for training” for all young people up to 18 years (Ausbildungsgarantie) has been formulated, which has still to be implemented. Several issues and elements have to be considered and integrated in order to make the guarantee operative (sustainable training alternatives for disadvantaged young people, reorganisation of the transition after compulsory schooling and evaluation of the VET-schools, improvement of basic competences, etc.).
- The issue of education and training opportunities of the migrant population has come up as a fundamental challenge that ranges from the very early foundations in the elementary phase of education through the necessary support during initial education and training, to the support of use of competences and qualifications during adult life, and the reduction of de-qualification.
- From international and European sources the issues of equity and equality of opportunity have reached also the Austrian discourses about education and training policies that had neglected these issues for a long time. More recently, an initiative of the Austrian industrialists has put many fundamental issues of the quality of the Austrian education system on the agenda, including structural questions of early tracking. This initiative has reached the policy agenda, and has lead to rather fundamental political change and conflict, with a new attempt to reform the lower secondary level towards a comprehensive school.

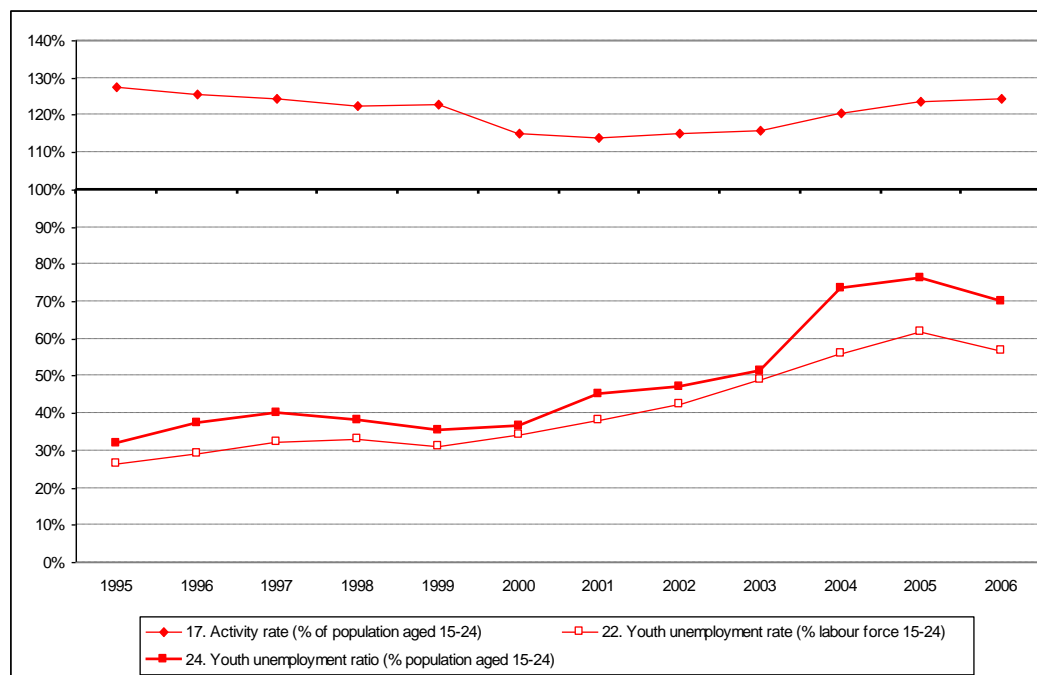
1.5. Transition to the labour market

- VET as a preparation to enter the labour market

Several aggregate figures concerning the qualification of young people and of the population, as well as the transition into employment give a comparatively favourable account of Austria. The EU-Benchmarks about completion are fairly above the average and the early school-leavers are below the average. In Austria, VET is clearly designed as a preparation to enter the labour market. However, the information available about how good this preparation might be is almost completely

lacking.¹³ The main indicator used concerns unemployment figures. Youth unemployment is low in Austria, however, it has been on the rise relative to the EU-average in recent years (figure 7). In 1996 youth unemployment was at about only 30% of the EU-average, until 2006 this figure has increased to about 70%.

Figure 7: Austrian youth activity rate, unemployment rate and ratio related to the EU-27 rates



Source: Employment in Europe 2007 indicators, own calculation and picture.

A specific issue concerns the two thresholds created by the apprenticeship system, as indicated by the younger (15-19-years old; first threshold) and the older (20-24-years old; second threshold) group of young people. Much of the attention is placed to the first threshold, and in particular to the inflow into apprenticeship. Apprenticeship here clearly seems to be a part of the solution of transition problems. However, the second threshold and unemployment of the 20-24-years old is much less focused on. If we see apprenticeship as a part of initial education and training, the transition takes place at the second threshold. In fact there is no monitoring of this transition in Austria. Unemployment of the older group is much higher than that of the younger group. A specific study¹⁴ has analysed the labour market experience of the 1980 born

¹³ A recent R&D-project has analysed more deeply the available data about transition on a detailed level of VET-programmes. It has been shown that even the figures of the LFS do not contain reliable information on that level: Lassnigg L / Vogtenhuber S (2007) Klassifikationsentwicklung von Ausbildung und Beruf. IHS-Forschungsbericht. Wien.

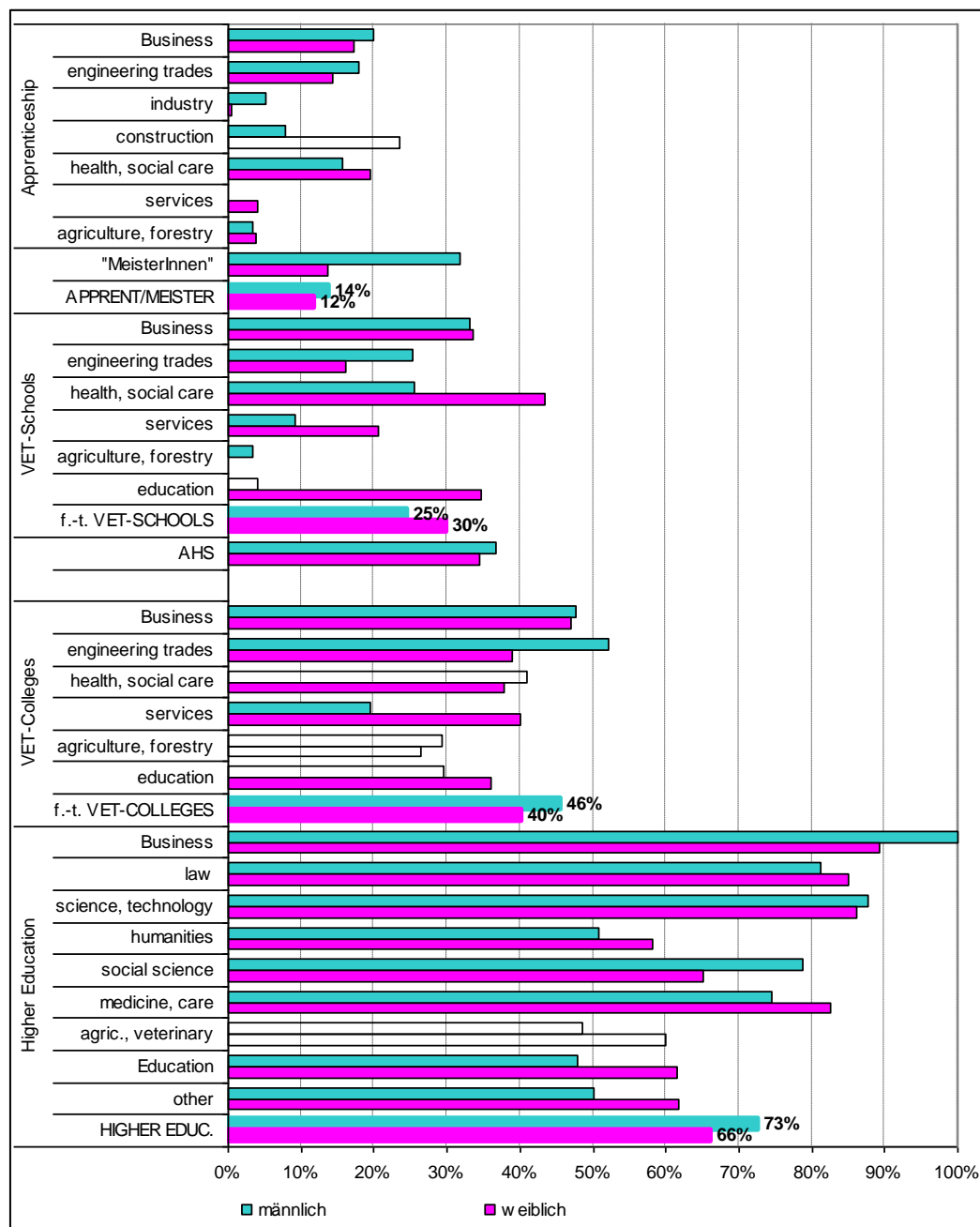
¹⁴ See the detailed analysis of the employment integration of the birth cohort 1980 until age 25 in 2005 by Synthesis-Forschung: Österreich Download <http://www.forschungsnetzwerk.at/downloadpub>

age cohort until their age 25 with quite interesting results. The basis of this snapshot have been the total social security records of all young people who had a registered employment or unemployment spell (those, who did not have any registered contact with the employment system are not included in the data).

We can see that 57% of the age cohort had already contact to the public employment service, 35% had been unemployed at least once, 9% had been already unemployed in four or more years until age 25, and 20% of young people have been affected from unemployment during the year 2005 at age 25. Even in a country with favourable overall figures, the experience of unemployment by young people is by far not an exceptional experience, and almost for one in ten young people it is a frequently recurring experience.

Half of the age group (48%) have been integrated in a continuous employment at age 25, further 27% have been integrated predominantly, and 25% have been poorly integrated or not at all (4%). This shows that in a country with high youth employment, the integration into stable standard employment is a rather long and complex process.

**Figure 8: Rates of return of training specialisations for men and women
(Increase of hourly wage as compared to compulsory school only)**



Source: Steiner P. M., Schuster, J., Vogtenhuber S. (2007): Bildungserträge in Österreich von 1999 bis 2005. Projektbericht des IHS in Kooperation mit Statistik Austria.

From those who had started an apprenticeship until age 25 (37% of the age group), about 17% were drop-outs at age 25, and 30% of the beginners of an apprenticeship training had been affected by unemployment during their early career (slightly less than the whole group). At age 25 only 4% of those who had started an apprenticeship still were employed in their training enterprise (a figure that is difficult to believe,

and would indicate that the demand of providers of apprenticeship is in fact very little driven by their own qualification requirements), and 37% were still employed in the same economic sector.

These figures indicate that also in a system with good overall figures the transition process is quite difficult for a big proportion of young people. Unfortunately, we cannot give any clear indications about the different values of the various VET qualifications in the transition process. There are only aggregate figures about the rates of return for men and women available, that show a clear hierarchy between the different levels of VET-programmes. The candidate programmes for the LSA fall within the business, engineering and construction trades of apprenticeship and VET-schools. Those categories show slightly above returns among apprenticeships and mixed returns among VET-schools. The returns of VET-colleges and higher education programmes are substantially higher.

- National settings of relating VET to work (e.g., close, loose, varied)

In the Austrian system VET is closely related to work and employment from the point of view of the education and training programmes. A very high proportion of the population as well as of young people is completing a VET-programme. About one third is trained in apprenticeship programmes directly related to the world of work. Full-time VET-schools/colleges provide vocational/professional qualifications based on broader profiles that include attempts to be regularly updated to the requirements of work, as well as to broader societal and educational needs. That evaluation and updating mainly uses informal channels. Specific task forces and evaluation procedures are set up for periodic updates of the curricula, the VET-schools/colleges are supported by boards that include regional/local employers, and an important informal mechanism of being up-to-date is the employment experience of many teachers in the regular economy beneath their teaching responsibilities.

However, the relationship between VET and work is mainly monitored at a micro-level and informal base. Accurate objective indications about the relationship of VET and work are lacking. In fact this means that the relationship is mainly using local and idiosyncratic knowledge from specific informal information sources. That might produce a certain kind of myopia, as specific kinds of “insiders” with specific interests might control the system. There are many signs that the VET system might be driven by rather traditional and local parts of the economy, and the more dynamic and innovative parts might be served sub optimally. Recently the Austrian Industrialists¹⁵ have published a report that points to strong needs for reform of the

¹⁵ IV-Industriellenvereinigung (2006) Zukunft der Bildung. http://www.iv-mitgliederservice.at/iv-all/publikationen/file_375.pdf; http://www.iv-mitgliederservice.at/iv-all/publikationen/file_376.pdf

education and training system, and the social partners have also set an initiative¹⁶ for reform of the system towards a stronger emphasis on lifelong learning.

The VET-LSA can be seen as an important step towards filling a basic information gap by providing an objective comparative account of the competences acquired in the lower level sector of VET. In particular the moves towards standards in the full-time sector can be supported by research, as well as the attempts to find more objective information for the outcome orientation, that is a main goal of education and training policy.

Further information

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Internet resource: http://www.cedefop.europa.eu/etv/Information_resources/NationalVet/Thematic/ click Austria.

¹⁶ BEIRAT FÜR WIRTSCHAFTS- UND SOZIALFRAGEN.(2007) CHANCE BILDUNG. Konzepte der österreichischen Sozialpartner zum lebensbegleitenden Lernen als Beitrag zur Lissabon-Strategie. Bad Ischl im Oktober 2007 http://www.sozialpartner.at/sozialpartner/ChanceBildung_20071003.pdf

2. National implementation of the Feasibility Study

Two national Workshops were conducted and organised together for all three compared vocational fields: Carmechatronics, Electrician (craft sector) and Business & Administration. The 1st workshop took place on Nov. 28, 2008, the 2nd one on Jan. 26, 2009. Following the guidelines of the VET-LSA Feasibility Study, the first Workshop started with a common introduction into the study and concept of VET-LSA by the national coordinators. After separating the groups into the three vocational areas, the national expert introduced the vocational area and the research tool followed by discussions and comments from the experts. Then, occupational tasks, qualification requirements and assessment tasks were assessed by the participating experts.

The second workshop also started with a common introduction into the feasibility study and concept of VET-LSA as well as a preliminary report of the international meeting in Berlin (Jan.14, 2009) by the national coordinators. The first plenum session ended with short presentations of the three occupational groups about their main results of the first workshop. Then the group split into the three vocational areas where national and international results of the first workshops were presented in detail. As the final international set of assessment tasks was not completed, the rating of the final set of international assessment tasks was conducted electronically after Workshop II.

Chapter 2 reports the results of the Feasibility study for the three vocational areas. It starts with general information on the VET programme, followed by the rating results of occupational tasks and qualification requirements. The level of performance at the end of VET concludes the report of each vocational area. As the Feasibility study adopted a qualitative research approach, a major part of this chapter is to reflect the views, notes and comments expressed by the experts during the national workshops.

Mario Steiner (IHS)

2.1. Report on the occupational field of Car-Mechatronic

2.1.1. General information on the VET programme

title of VET programme	apprenticeship education in motor vehicle engineering (KFZ-Techniker/in)
total duration (years)	3.5 years, starting at 10 th grade
number of graduates (in 2007) <ul style="list-style-type: none"> - total number graduates - male/female - reference (national statistics) 	1,976 of which male: 1,941 (98%), female 35 (2%) proportion successful: 74% (2,677 final exams) (Source: WKO) (Number of graduates from full-time vocational school in the field of mechanical engineering/motor vehicles: 30 in 2007)
ISCED level	ISCED 3B
entry requirements <ul style="list-style-type: none"> - formal - actual/common 	formal entry requirement is a completion of 9 years of compulsory schooling (success irrelevant) Actual entry requirement: at least a positive completion of lower secondary schooling is required
access to next level of education/training	<ul style="list-style-type: none"> - External Exam for general higher education entrance (based on accreditation of prior learning), Higher Education Entrance Examination - master craftsperson course, foreperson course (ISCED 5B) - Bridge course for VET college (ISCED 4A) - University of applied sciences (ISCED 5A), additional tests required
Organisation/learning arrangements <ul style="list-style-type: none"> - training workplace (%) - training school (%) - alternating programme - periods of training in school and at the workplace 	<ul style="list-style-type: none"> - Training on workplace: 80% - Training in school: 20% - In rural areas: longer periods of training in school (e.g. 2 months) and the rest of the year workplace training. - In urban areas: one day a week in school, four days on workplace

2.1.2. Occupational Tasks and Qualification Requirements

Rating of occupational Tasks

Nr.	Occupational task (O*NET task descriptors)	How <u>relevant</u> is the task on average to the performance of <u>Car-Mechatronics</u> ?					
		not relevant (1)	somewhat relevant	relevant	very relevant	extremely relevant (5)	MEAN
4	Follow checklists (service plans) to ensure all important parts are examined, including belts, hoses, steering systems, spark plugs, brake and fuel systems, wheel bearings, and other potentially troublesome areas.	0	0	1	3	6	4,5
2	Test components and systems, using standard set of tools and special equipment such as infrared engine analyzers, compression gauges, oscilloscopes, multimeters, computerized diagnostic devices, brake test stand.	0	0	0	5	5	4,5
1	Sensual (e.g. visual) and functional examination of vehicles to determine extent of damage or malfunctions.	0	1	1	1	7	4,4
3	Specifically use electronic test equipment to locate and correct malfunctions in fuel, ignition, and emissions control systems.	0	0	1	6	3	4,2
13	Repair, overhaul, and adjust automobile brake systems.	0	1	0	5	4	4,2
6	Test and adjust repaired systems to meet manufacturers' performance specifications.	0	0	2	4	2	4,0
7	Perform routine and scheduled maintenance services such as oil changes, lubrications and tune-ups.	0	1	2	2	4	4,0
9	Overhaul or replace aggregates, component groups and components such as blowers, generators, distributors, starters and pumps.	0	1	0	6	2	4,0
10	Repair and service the HVAC system such as air conditioning, heating, engine-cooling, and electrical systems.	0	0	4	5	1	3,7
14	Repair suspension and undercarriage.	0	1	4	3	2	3,6
5	Plan work procedures, using charts, technical manuals, vehicle data bases and experience.	0	1	5	2	2	3,5
8	Disassemble units and inspect parts for wear, using micrometers, calipers, and gauges.	0	3	1	5	1	3,4
12	Tear down, repair, and rebuild faulty assemblies such as power systems, steering systems, and linkages.	0	3	2	3	1	3,2
11	Repair or replace engines, manual and automatic gearboxes and transmission parts or whole aggregates such as pistons, rods, gears, valves and bearings.	1	4	1	2	2	3,0

Nr.	Occupational task (O*NET task descriptors)	How <u>often</u> is the task performed?					
		(1) several times a year	several times a month	several times a week	daily	(5) several times daily	MEAN
1	Sensual (e.g. visual) and functional examination of vehicles to determine extent of damage or malfunctions.	0	0	0	3	6	4,7
7	Perform routine and scheduled maintenance services such as oil changes, lubrications and tune-ups.	0	0	1	1	6	4,6
4	Follow checklists (service plans) to ensure all important parts are examined, including belts, hoses, steering systems, spark plugs, brake and fuel systems, wheel bearings, and other potentially troublesome areas.	0	0	1	2	6	4,6
2	Test components and systems, using standard set of tools and special equipment such as infrared engine analyzers, compression gauges, oscilloscopes, multimeters, computerized diagnostic devices, brake test stand.	0	0	1	5	3	4,2
3	Specifically use electronic test equipment to locate and correct malfunctions in fuel, ignition, and emissions control systems.	0	0	3	5	1	3,8
13	Repair, overhaul, and adjust automobile brake systems.	0	0	5	3	1	3,6
6	Test and adjust repaired systems to meet manufacturers' performance specifications.	0	1	2	5	0	3,5
9	Overhaul or replace aggregates, component groups and components such as blowers, generators, distributors, starters and pumps.	0	3	2	2	1	3,1
5	Plan work procedures, using charts, technical manuals, vehicle data bases and experience.	0	4	1	3	1	3,1
10	Repair and service the HVAC system such as air conditioning, heating, engine-cooling, and electrical systems.	0	3	3	3	0	3,0
12	Tear down, repair, and rebuild faulty assemblies such as power systems, steering systems, and linkages.	1	5	1	1	1	2,6
14	Repair suspension and undercarriage.	0	5	3	1	0	2,6
11	Repair or replace engines, manual and automatic gearboxes and transmission parts or whole aggregates such as pistons, rods, gears, valves and bearings.	4	3	1	1	0	1,9
8	Disassemble units and inspect parts for wear, using micrometers, calipers, and gauges.	4	3	1	1	0	1,9

Rating of Qualification Requirements

Nr .	Qualification requirements (O*NET knowledge descriptors)	How <u>relevant</u> is the qualification requirement for Car-Mechatronics to perform successfully on the labor market?					
		not relevant (1)	somewhat relevant	relevant	very relevant	extremely relevant (5)	MEAN
1	Mechanical — Knowledge, skills, and abilities of machines and tools, including their designs, uses, repair, and maintenance.	0	0	0	1	9	4,9
3	Computers and Electronics — Knowledge, skills, and abilities of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.	0	0	0	4	6	4,6
2	Engineering and Technology — Knowledge, skills, and abilities of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.	0	0	2	1	7	4,5
8	National Language — Knowledge, skills, and abilities of the structure and content of the national language including the meaning and spelling of words, rules of composition, and grammar.	0	0	4	3	3	3,9
4	Customer and Personal Service — Knowledge, skills, and abilities of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.	0	1	4	2	3	3,7
7	Chemistry — Knowledge, skills, and abilities of the chemical composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.	0	4	4	2	0	2,8
6	Physics — Knowledge, skills, and abilities and prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub- atomic structures and processes.	0	3	7	0	0	2,7
9	Foreign (English) Language — Knowledge, skills, and abilities of the structure and content of the Foreign (English) language including the meaning and spelling of words, rules of composition, and grammar.	0	4	5	1	0	2,7
5	Mathematics — Knowledge, skills, and abilities of arithmetic, algebra, geometry, calculus, statistics, and their applications.	0	5	5	0	0	2,5

Workshop discussion: Feedback concerning the occupational tasks:

All the occupational tasks mentioned in O*Net are more or less relevant, but ...

- ... an antiquated vocabulary (e.g. spark plugs) is used to describe the tasks. It is obvious that the tasks were formulated 15-20 years ago and have not been reformulated according to technological change. Therefore the tasks also are not future-oriented enough. Hybrid and electro cars will gain lots of significance in the next 10 years.
- ... the list of occupational tasks is classified as typical American. All the technical terms used concentrate on petrol-engines whereas diesel-engines and diesel-technology, which are very relevant in Austria, are neglected.

In line with this feedback the experts formulated additional occupational tasks required for the Austrian situation. The list should be extended by

- Tasks connected with service/repair of diesel-engines and technology
- Test/service/repair of security- and comfort-systems (ABS, AC, ...) and
- The installation of additional car-equipment (like audio-systems, etc.)

Feedback concerning the qualification requirements:

The qualification requirements formulated in the context of O*Net represent school knowledge quite well, but ...

- ... they do not cover skills acquired via practical training which are very relevant within the context of the Austrian dual system.
- ... the formulation of the qualification requirements is not specific enough: There should be a concentration on operational/practical knowledge, whereas theory (e.g. topology of electronic networks and busses) and scientific knowledge (e.g. engineering science) is hardly relevant.

The feedback concerning the individual qualification requirements differs:

- Mathematics: Algebra, geometry, calculus, statistics are hardly of relevance in the occupational field of car-mechatronics.
- Physics and chemistry are not taught per se but only in the context of related and more applied topics und subjects.
- Concerning the foreign language the knowledge of specific vocabulary is much more relevant than the knowledge of rules of composition and grammar.

Additional qualification requirements needed in order to complete the O*Net list are:

- Social competences
- Knowledge of (and ability to read) domain specific technical language

Feedback concerning the rating-results

A) National Rating results:

The ranking of occupational tasks and qualification requirements as a result of the ratings in the first workshop seems accurate, but the differences in mean sometimes too big. If a occupational task and qualification requirement is ranked low, this does not necessarily mean, that the task/qualification is not needed at all. It simply can be the expression of not accurate formulation of items (e.g. mathematics sure is important for the occupational field of Car-mechatronics, but algebra and statistics as mentioned in the context of mathematics is not).

The ranking of the qualification requirement ‘customer and personal service’ seems too high. These are skills employers and master craftsmen need but the average employee, whose job is to repair cars, does not.

The rather low ranking of the national language is surprising. In the context of an high proportion of apprentices not sufficient capable of the national language it was expected, that this qualification requirement is ranked higher although the dual education is not the right place to mend these deficits.

B) International Rating results:

The matching of ratings in the participation countries surprises and seems to be a good basis for international comparison within VET-LSA. The reason for the homogeneity can be found in the international character of the occupational field per se. All over Europe we all drive the same cars and they have the same problems and weaknesses everywhere. Therefore the same skills are needed in all the participating countries to repair and maintain them.

The experts expected the foreign language in an international context to rank higher than it actually does. A possible explanation for this result can be found in the formulation of the qualification requirement within O*Net. In the field of Car-Mechatronic the knowledge of specific vocabulary is much more relevant than the knowledge of rules of composition and grammar.

Finally the rating results also have to be interpreted within the national context. For Austria the national language as qualification requirement ranks high as we have got specific problems in this field among our apprentices. In other countries, where you can find different recruiting routes and a different composition of pupils this requirement will rank lower.

2.1.3. Level of performance at the end of VET

Description of national Assessment Tasks

The 10 assessment tasks described below and rated by the experts participating in the first national workshop were selected from a pool of tasks used for the apprenticeship final exams (Lehrabschlussprüfung) in Vienna.

- 1) **Explain tools and machines:** Explanation of and knowledge about torque and welding.
- 2) **Undercarriage:** Definition of technical terms, Explanation of possible malfunctions.
- 3) **Diagnosis** of a broken cylinder head sealing and examination of a clutch.
- 4) **Applied Mathematics:** Hydraulic calculation for a break system.
- 5) **Electric wiring diagram:** Explain and add functions to a given diagram.
- 6) **Air break diagram:** Explain and add missing connections to a given diagram.
- 7) **Battery, starter, generator:** Check the function practically and interpret the values measured.
- 8) **Practical inspection and reparation of gear box:** The task is to take apart and reassemble a gear box in practice, diagnosis of malfunction and to answer theoretical questions (name parts, calculate gear ratio, ...).
- 9) **Clutch:** Explain possibilities to repair a clutch, answer theoretical questions.
- 10) **Engine compression:** Interpret given measurement diagrams and design a sequence of operations to measure compression.

Rating of Tasks

Educational objectives at the end of VET	Nr.	Assessment tasks	The task is representing major educational objectives at the end of Car-Mechatronics				
			Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)	MEAN
	7	Practical examination of battery, starter, generator	0	0	3	6	3,7
	2	Undercarriage (Definitions, Function, malfunction)	0	0	5	4	3,4
	5	Electric wiring diagram	0	1	4	4	3,3
	3	Diagnosis (e.g. clutch malfunction, cylinder head)	0	0	6	3	3,3
	10	Diagnosis of engine compression	0	1	5	3	3,2
	1	Explain tools and machines	0	1	5	3	3,2
	9	Explanation of a clutch	0	2	5	2	3,0
	8	Practical inspection and reparation of gear box	0	3	5	1	2,8
	4	Hydraulic calculations	1	6	1	0	2,0
	6	Air break diagram	2	6	1	0	1,9

Occupational tasks required in the labour market	Nr.	Assessment tasks	How relevant is the task for successful performance of Car-Mechatronics in the labour market?				
			(1) not relevant	Some-what relevant	relevant	(4) very relevant	MEAN
	5	Electric wiring diagram	0	0	5	5	3,5
	2	Undercarriage (Definitions, Function, malfunction)	0	0	5	5	3,5
	3	Diagnosis (e.g. clutch malfunction, cylinder head)	0	1	3	5	3,4
	7	Practical examination of battery, starter, generator	0	0	6	4	3,4
	9	Explanation of a clutch	0	3	3	4	3,1
	1	Explain tools and machines	0	3	3	4	3,1
	10	Diagnosis of engine compression	0	2	5	3	3,1
	8	Practical inspection and reparation of gear box	0	5	2	2	2,7
	6	Air break diagram	3	4	2	1	2,1
	4	Hydraulic calculations	3	6	1	0	1,8

Level of complexity	Nr.	Assessment tasks	Indicate the level of complexity! (level 1 little complexity, level 5 high complexity)					
			1	2	3	4	5	Mean
	6	Air break diagram	0	1	0	1	8	4,6
	5	Electric wiring diagram	0	0	3	3	4	4,1
	10	Diagnosis of engine compression	0	0	3	5	2	3,9
	8	Practical inspection and reparation of gear box	0	1	2	6	1	3,7
	2	Undercarriage (Definitions, Function, malfunction)	0	1	4	3	2	3,6
	9	Explanation of a clutch	0	1	4	4	1	3,5
	7	Practical examination of battery, starter, generator	0	1	5	3	1	3,4
	3	Diagnosis (e.g. clutch malfunction, cylinder head)	0	2	4	3	1	3,3
Likelihood to master the task successfully	4	Hydraulic calculations	1	4	2	2	1	2,8
	1	Explain tools and machines	2	3	3	2	0	2,5

Likelihood to master the task successfully	Nr.	Assessment tasks	Indicate your perceived likelihood that students are able to successfully master the task! (level 1 not at all likely, level 5 extremely likely)					
			1	2	3	4	5	Mean
	3	Diagnosis (e.g. clutch malfunction, cylinder head)	0	0	4	5	1	3,7
	1	Explain tools and machines	0	2	2	4	2	3,6
	9	Explanation of a clutch	0	0	7	1	2	3,5
	7	Practical examination of battery, starter, generator	0	2	2	6	0	3,4
	2	Undercarriage (Definitions, Function, malfunction)	0	0	6	4	0	3,4
	10	Diagnosis of engine compression	0	0	7	3	0	3,3
	8	Practical inspection and reparation of gear box	0	3	5	1	1	3,0
	5	Electric wiring diagram	0	2	7	1	0	2,9
Level of complexity	4	Hydraulic calculations	1	8	0	1	0	2,1
	6	Air break diagram	6	4	0	0	0	1,4

Feedback to Tasks and Assessments in General

Feedback concerning the selected assessment tasks:

- From the chosen national assessment tasks some examples are antiquated (e.g. gear boxes are not repaired any more) others too theoretical (e.g. air break) and some formulated inexactly.
- Additional assessment tasks would be needed in the field of diagnosis and should consist of the following parts: Choose measurement instruments on the basis of a described malfunction, search for technical information, design

a sequence of operations to check the systems/parts concerned, find the parts concerned in practice and replace them, check the system again, if the malfunction is solved.

General Feedback on Assessments:

- Computer assessment as planned in VET-LSA is not adequate to meet tacit knowledge and practical competences acquired during dual education.
- Paper and pencil tests as well as computer assessments concentrate on formal education and theoretical knowledge exclusively, whereas the apprenticeship consists only of 20% school-education but 80% practical training. Therefore VET-LSA tests 20% of the acquired skills and more or less neglects the remaining 80%.
- In Austria a large proportion of apprentices in the occupational field of car-mechatronics have got a migrant background and face specific (e.g. language) difficulties. We have to keep this in mind if we compare the results between different countries.
- Assessment tasks (theoretical ones) requiring a lot of individual formulations are not suitable for the target group because the language skills of many students are not sufficient.
- Some measures of active labour market policy in Austria reintegrate young people at risk into the educational system, e.g. via offering an apprenticeship training. This is also the case for car-mechatronics. The pupils in vocational schools – which is the test-population of VET-LSA – therefore consist of regular apprentices and of participants in measures of active labour market policy. This is a specific challenge for the comparability of test results.

Rating of international Assessment Tasks:

The task is representing major educational objectives at the end of Car-Mechatronics		MEAN
EM 1	repair fuel injection (benzin) and test pollutant emission	3,9
EM 2a	repair fuel injection (diesel)	3,8
EM 2b	troubleshooting pollutant emission (diesel)	3,8
EM 3a	replacement of toothed belt (practical)	4,0
EM 3b	replacement of toothed belt (theoretical)	3,5
BS 1	inspection brakes and ABS	3,8
BS 2	troubleshooting brake system (ABS/ESP)	3,6
UC 1	axle measurement	3,8
UC 2	suspension	2,8
PT 1	gear box	3,1
PT 2	repair clutch	3,6
PT 3	drive axle repair	3,1
CSS 1	repair air conditioning	3,4
CSS 2a	troubleshooting AC	3,8
CSS 2b	maintenance AC	3,6
CSS 3	programming convenience functions	3,3

Part 2: Complexity

Indicate the level of complexity! (level 1 little complexity, level 4 high complexity)		MEAN
EM 1	repair fuel injection (benzin) and test pollutant emission	3,8
EM 2a	repair fuel injection (diesel)	3,8
EM 2b	troubleshooting pollutant emission (diesel)	3,3
EM 3a	replacement of toothed belt (practical)	2,8
EM 3b	replacement of toothed belt (theoretical)	2,6
BS 1	inspection brakes and ABS	3,1
BS 2	troubleshooting brake system (ABS/ESP)	3,5
UC 1	axle measurement	2,9
UC 2	suspension	2,8
PT 1	gear box	2,8
PT 2	repair clutch	2,3
PT 3	drive axle repair	2,1
CSS 1	repair air conditioning	3,1
CSS 2a	troubleshooting AC	3,9
CSS 2b	maintenance AC	3,0
CSS 3	programming convenience functions	3,5

Discussion of international Tasks

The second national workshop in Austria took place before a common agreed sample of international assessment tasks was selected. Therefore not all the assessment tasks in the sample could be discussed on the workshop, but only several ones: repair fuel injection (diesel), troubleshooting pollutant emission (diesel), replacement of toothed belt (practical), inspection brakes and ABS.

All in all the presented international examples of assessment tasks are considered as suitable for Austrian apprentices at the end of their education. Most of them should be able to more or less successfully master the tasks.

The duration of the assessment tasks ‘replacement of toothed belt (practical)’ (6 hours) and ‘inspection of brakes and ABS’ (16 hours) seem extraordinary long. If employees in the occupational field of car-mechatronics have to perform these tasks they may not need more than three hours.

On the other hand side apprentices need more than 50 minutes of time to accomplish the task of ‘fuel injection (diesel)’. This task takes at least 20 minutes to read it and because of the huge workload to be solved no time remains to understand the example and think about it. This task has more a touch of an intelligence test than a test of occupational competences.

The task ‘troubleshooting pollutant emission (diesel)’ is a very good one. This task is very similar to the feedback on the first workshop that an additional task is needed in the field of diagnosis that consist of designing a sequence of operations to check a repair system on the basis of a described malfunction.

Stefan Vogtenhuber (IHS)

2.2. Report on the occupational field of Electrician (craft)

At the first Austrian workshop, 7 experts in the field of Electrician (craft sector) participated. 6 experts had a school background: 4 were headmasters or teachers from Vocational schools for apprentices and 2 were Head of department of VET – schools/colleges. Only 1 participating expert, whose institutional background is the Austrian Federal Economic Chamber, represented the workplace-side of apprenticeship training. To accomplish 10 ratings in sum and to include the expertise of members and instructors of training firms respectively, 3 additional ratings were conducted in the course of interviews following the workshop. These three experts run apprenticing companies and are also members of state guilds of the Chamber of Commerce (cf. chapter 4.2).

2.2.1. General information on the VET programme

In the following table, facts of two different VET programmes are reported which lead to the same qualification in the field of electricians (craft): the apprenticeship programme in electrical installations engineering (duration of 3.5 years) and the VET school in electrical engineering. We decided to report VET schools in this table to show that there are different ways in the Austrian initial VET system to obtain one qualification. In contrast to apprenticeship programmes, VET – schools/colleges usually provide qualifications in more than one field. However within the feasibility study the focus lies on the apprenticeship programme and consequently the expert ratings reflect this programme only.

title of VET programmes	<ol style="list-style-type: none"> 1. apprenticeship training in electrical installations engineering (Lehre Elektroinstallationstechnik) 2. VET school for electrical engineering (Fachschule für Elektrotechnik)
total duration (years)	<ol style="list-style-type: none"> 1. 3.5 years, starting at 10th grade 2. 4 years, starting at 9th grade
number of graduates (in 2007) <ul style="list-style-type: none"> - total number graduates - male/female - reference 	<ol style="list-style-type: none"> 1. 1,149 (2007) of which male: 1,131 (98%), female: 18 (2%) proportion successful: 71% (1,612 final exams) 2. 264 (2005/06) of which male: 261 (99%), female: 3 (1%) proportion successful: 89% (297 final exams) (Source: WKO, Statistics Austria)
ISCED level	ISCED 3B
entry requirements <ul style="list-style-type: none"> - formal - actual/common 	<ol style="list-style-type: none"> 1. formal entry requirement is a completion of 9 years of compulsory schooling (success irrelevant); usually at least a positive completion of lower secondary schooling is required 2. positive completion of lower secondary schooling, in some cases, an additional test is required
access to next level of education/training	<ul style="list-style-type: none"> - External Exam for general higher education entrance (based on accreditation of prior learning), Higher Education Entrance Examination; - Master craftsperson course, foreperson course (ISCED 5B) - Bridge course (apprenticeship programme) or add-on course (VET school or bridge course) for VET college (ISCED 4A) - University of applied sciences (ISCED 5A), additional tests required
Organisation/learning arrangements <ul style="list-style-type: none"> - training workplace (%) - training school (%) - alternating programme - <input type="checkbox"/> periods of training in school and at the workplace 	Apprenticeship training: 80% workplace training and 20% in school (part-time vocational school) Teaching can be organised as follows: <ul style="list-style-type: none"> - <i>all year round</i>: i.e. at least on one full school-day or at least two half school-days a week - <i>by block</i>: i.e. for at least eight weeks continuously - <i>seasonally</i>: i.e. teaching takes place in block form at a particular time of year VET school: 100% school based education including about one third of total instruction time dedicated to practical training (workshop, laboratory)

2.2.2. Occupational Tasks and Qualification Requirements

Rating of Occupational Tasks

Nr	Occupational task (O*NET task descriptors)	How relevant is the task on average to the performance of Electricians (craft sector)?					
		not relevant	somewhat relevant	relevant	very relevant	extremely relevant	MEAN
9	Place conduit, pipes or tubing, inside designated partitions, walls, or other concealed areas, and pull insulated wires or cables through the conduit to complete circuits between boxes.	0	0	2	1	7	4,5
2	Assemble, install, test, and maintain electrical or electronic wiring, equipment, appliances, apparatus, and fixtures, using hand tools and power tools.	0	0	2	2	6	4,4
3	Install ground leads and connect power cables to equipment, e.g. motors, or appliances such as refrigerators, washing machines, and stoves.	0	1	2	1	6	4,2
1	Plan layout and installation of electrical wiring, equipment and fixtures, based on job specifications and local codes.	0	2	1	3	4	3,9
5	Diagnose malfunctioning systems, apparatus, and components, using test equipment and testing devices such as ohmmeters, voltmeters, and oscilloscopes as well as hand tools, to locate the cause of a breakdown and correct the problem.	0	0	5	2	3	3,8
12	Prepare sketches or follow blueprints to determine the location of wiring and equipment and to ensure conformance to building and safety codes.	0	1	3	3	3	3,8
6	Inspect electrical systems, equipment, and components to identify hazards, defects, and the need for adjustment or repair, and to ensure compliance with codes.	0	2	1	3	3	3,8
4	Observe and test operation of appliances following installation, and make any initial installation adjustments that are necessary.	0	1	4	3	2	3,6
8	Trace electrical circuits, following diagrams, and conduct tests with circuit testers and other equipment to locate shorts and grounds.	0	2	3	2	3	3,6
11	Refer to schematic drawings, product manuals, and troubleshooting guides in order to diagnose and repair problems.	0	3	3	2	2	3,3
10	Fasten small metal or plastic boxes to walls to house electrical switches or outlets.	1	3	2	0	3	3,1
7	Service and repair domestic electrical appliances such as clothes washers, refrigerators, stoves, and dryers.	1	6	2	0	1	2,4
<i>Additional national occupational tasks</i>							
1	Installation, testing and documentation of electrical safety measures according to standards, rules and regulations	0	0	0	2	8	4,8
2	Establishing electrical service entrance for houses / feed for machines	0	1	1	4	4	4,1
3	Implementaion and testing of bus systems for building automation (KNX)	0	1	3	2	4	3,9

Nr.	Occupational task (O*NET task descriptors)	How <u>often</u> is the task performed?					
		several times a year	several times a month	several times a week	daily	several times daily	MEAN
9	Place conduit, pipes or tubing, inside designated partitions, walls, or other concealed areas, and pull insulated wires or cables through the conduit to complete circuits between boxes.	0	0	0	5	4	4,4
10	Fasten small metal or plastic boxes to walls to house electrical switches or outlets.	0	1	0	3	3	4,1
2	Assemble, install, test, and maintain electrical or electronic wiring, equipment, appliances, apparatus, and fixtures, using hand tools and power tools.	0	2	2	2	4	3,8
3	Install ground leads and connect power cables to equipment, e.g. motors, or appliances such as refrigerators, washing machines, and stoves.	0	3	1	5	1	3,4
1	Plan layout and installation of electrical wiring, equipment and fixtures, based on job specifications and local codes.	2	2	1	3	1	2,9
4	Observe and test operation of appliances following installation, and make any initial installation adjustments that are necessary.	0	4	4	2	0	2,8
5	Diagnose malfunctioning systems, apparatus, and components, using test equipment and testing devices such as ohmmeters, voltmeters, and oscilloscopes as well as hand tools, to locate the cause of a breakdown and correct the problem.	1	3	3	1	1	2,8
12	Prepare sketches or follow blueprints to determine the location of wiring and equipment and to ensure conformance to building and safety codes.	1	5	2	1	1	2,6
8	Trace electrical circuits, following diagrams, and conduct tests with circuit testers and other equipment to locate shorts and grounds.	2	5	0	2	1	2,5
6	Inspect electrical systems, equipment, and components to identify hazards, defects, and the need for adjustment or repair, and to ensure compliance with codes.	2	3	2	2	0	2,4
11	Refer to schematic drawings, product manuals, and troubleshooting guides in order to diagnose and repair problems.	3	4	3	0	0	2,0
7	Service and repair domestic electrical appliances such as clothes washers, refrigerators, stoves, and dryers.	6	2	1	0	0	1,4
<i>Additional national occupational tasks</i>							
1	Installation, testing and documentation of electrical safety measures according to standards, rules and regulations	0	4	3	2	1	3,0
2	Establishing electrical service entrance for houses / feed for machines	1	5	4	0	0	2,3
3	Implementaion and testing of bus systems for building automation (KNX)	3	4	1	1	0	2,0

Rating of Qualification Requirements

Nr.	Qualification requirements (O*NET knowledge descriptors)	How <u>relevant</u> is the qualification requirement to perform successfully on the labor market?					
		not relevant	somewhat relevant	relevant	very relevant	extremely relevant	MEAN
1	Building and Construction - Knowledge, skills, and abilities of materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads. <i>e.g. installation technology (electrical wiring and equipment like lamps, circuit breakers, cable routeing, wiring diagrams, European Installation Bus (EIB) etc.), functional check, work organization, troubleshooting, standards (Germany: KMK 2003 Rahmenlehrplan Elektroniker/-in für Energie- und Gebäudetechnik)</i>	0	2	0	0	8	4,4
2	Telecommunications - Knowledge, skills, and abilities of transmission, broadcasting, switching, control, and operation of telecommunications systems <i>e.g. call systems, equipment of telecommunication and telephone systems, aeriads, hazard alert systems (Germany: KMK 2003 Rahmenlehrplan Elektroniker/-in für Energie- und Gebäudetechnik)</i>	0	0	1	4	5	4,4
9	Customer and Personal Service - Knowledge, skills, and abilities of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction	0	0	0	6	4	4,4
8	English Language - Knowledge, skills, and abilities of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar	0	0	4	3	3	3,9
3	Engineering and Technology - Knowledge, skills, and abilities of the practical application of engineering science and technology. This includes applying principles, techniques, procedures and equipment to the design and products of various goods and services <i>e.g. direct, alternating and three-phase technology, hardwired program controller and programmable logic control, systematic troubleshooting, selection of equipment with respect for e.g. to model, mode and protection class (for e.g. motors), technique of starting and braking electric motors, regulation of rotary frequency, rectifier, safety and protection measures, protocols of commissioning (Germany: KMK 2003 Rahmenlehrplan Elektroniker/-in für Energie- und Gebäudetechnik)</i>	1	1	1	3	4	3,8
4	Computers and Electronics - Knowledge, skills, and abilities of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming	0	3	3	3	1	3,2
5	Mechanical - Knowledge, skills, and abilities of machines and tools, including their designs, uses, repair, and maintenance	0	5	4	1	0	2,6
6	Mathematics - Knowledge, skills, and abilities of arithmetic, algebra, geometry, calculus, statistics, and their applications	1	4	5	0	0	2,4
7	Physics - Knowledge, skills, and abilities of prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub- atomic structures and processes	4	4	1	0	0	1,7
<i>Additional national qualification requirements</i>							
2	<i>Accident avoidance and first aid-measures</i>	0	1	0	2	4	4,3
1	<i>Field related English competencies (basics)</i>	0	0	4	3	0	3,4

Feedback on occupational tasks (first workshop)

Previous to the rating, there was a discussion about each proposed occupational task. According to the experts view, most of the tasks were relevant to the performance of Electricians in the craft sector. Some experts mentioned that the selection of tasks is quite arbitrary: one could easily find a dozen of additional tasks, which are also quite relevant to Electricians. There are very general tasks where one can subsume a lot of important minor tasks. On contrary, there are very specific ones in the selection (e.g. Task 10). But in general, the Austrian national experts were quite satisfied with the proposed occupational tasks and suggested only two amendments:

- **No 9.** ... and pull insulated wires or “data” cables through... (add the word data)
- **No. 10.** was regarded as a too specific and simple task and can be subsumed in other tasks as well -> the majority of experts said that this item could be deleted, despite it is one of relevance, of course (see above).

The experts missed some tasks in the proposed list, which they regard as very important. Above all, the tasks do not cover the crucial area of safety and safety measures. In sum, the following 3 additional occupational tasks were formulated (and rated high in both dimensions):

1. Installation, testing and documentation of electrical safety measures according to standards, rules and regulations
2. Establishing electrical service entrance for houses/feed for machines
3. Implementation and testing of bus systems for building automation (EIB, KNX,...)

Discussion of ratings of occupational tasks (second workshop)

The participating experts accepted the national rating results regarding the ranking and the means as well. Some items show high rating variations, especially those with lower means. But this does not at all mean that lower rated tasks are irrelevant. One reason is that the notion of a “typical job” differs between the experts, another can be that the item formulation is not accurate, which leads to different understandings. One example for this is the occupational task No. 10 which was rated low regarding the importance (with a rather high dispersion), but which was rated very high regarding the frequency of performance at the workplace. This Austrian rating result contradicts the international results to some extent (internationally, the importance was ranked much higher, the frequency lower).

In contrast, task No. 7 was ranked lowest on both dimensions quite unanimous (with one outlier), and that result is in line with international results (The importance of this task is above all subject to firm-specific specialisation).

The experts were somewhat surprised that the matching of rating between the participating countries concerning the occupational tasks is that good, thus seeming to provide a solid basis for international comparison within VET-LSA.

In sum, the rating results of four items differed from the international mean to some extent in at least one dimension:

- No. 4 “Observe and test operation of appliances following installation and make any initial installation adjustments that are necessary”: lower relevance rating in Austria compared to international mean
- No. 9 “Place conduit, pipes or tubing, inside designated partitions, walls, or other concealed areas, and pull insulated wires or cables through the conduit to complete circuits between boxes”: higher frequency rating in Austria
- No. 10 “Fasten small metal or plastic boxes to walls to house electrical switches or outlets”: lower relevance and higher frequency rating in Austria compared to international mean
- No. 11 “Refer to schematic drawings, product manuals, and troubleshooting guides in order to diagnose and repair problems”: lower relevance and lower frequency rating in Austria compared to international mean

The three additional national tasks were rated very high with regard to the relevance but only partly with regard to the frequency.

Feedback on qualification requirements (first workshop)

The discussion of the proposed qualification requirements was more sceptical. Experts referred to the requirements as being too generic to rate them according to the labour market needs in the field of electrical craftsmen. Where available, experts focused on the domain specific concrete terms (which are written in *italics*).

In general, there was much discussion and criticism about the level of difficulty of the proposed qualification requirements: either the formulation yields at a far too difficult qualification requirement or it doesn't allow for an assessment of the required level (statements comprises all levels of difficulty, no distinction or assessment possible), respectively:

- **No. 4** Computer and electronics: participants recommended to add the level “basic knowledge” for the whole qualification requirement, then it would reflect the Austrian situation

- **No. 5** Mechanics: German word “Entwicklung” is not the right translation of design in this context (translation issue), because apprenticeship training doesn’t prepare to develop new things...
- **No. 6** Mathematics: differential calculus (in German) and also statistics is a far too high level of difficulty for apprentices
- **No. 7** Physics: mix of detailed and generic terms: “understanding ... atomic and sub-atomic structures and processes” -> also not adequate to describe QR of apprentices

The experts specified 2 additional qualification requirements:

1. Accident avoidance and first aid-measures
2. Field related English competencies (basic knowledge)

Discussion of ratings of qualification requirements (second Workshop)

Regarding the qualification requirements, there is less compliance between national and international ratings compared to the occupational tasks. In general, the rating was higher in Austria than in other countries despite the fact that the proposed set of qualification requirements were criticised (see results of WS I).

Main differences and explanations made by experts:

- No. 2: “*Telecommunications*” was rated as very important in Austria (national mean of 4.4 compared to international mean). Experts explained the high Austrian rating with the phrase “hazard alert systems” which they regard as very important, but does not really fit to the other aspects. They would rate the other mentioned qualification aspects “call systems, equipment of telecommunication and telephone systems, aeriels” lower.
- No. 3: “*Engineering and Technology*” was rated higher in Austria than in most other countries
- No. 4 “*Computer and Electronics*” was rated higher in Austria than in most other countries
- No. 7 “*Physics*” was rated lower in Austria (see comments of WS I)
- No. 8 “*English language*” was rated higher in Austria than in most other countries

Some experts questioned the usefulness of the qualification requirements: the formulations and explanations are quite arbitrary and too generic, leading to misunderstanding and confusion. So the interpretation of the ratings is therefore nearly impossible.

2.2.3. *Level of performance at the end of VET*

Previously to the first workshop, time was too short to collect a representative set of national assessment tasks. So the 10 national assessment tasks described below were selected in the course of the first national workshop. Most of the tasks were selected from the pool of practical tasks which are used for the apprenticeship final exams (Lehrabschlussprüfung). The final exams represent the workplace-side of apprenticeship training and are organised by the Federal States and their regional Chambers of Commerce. Since each State uses its own final examination tasks, which differ from each other to a quite large extent, one consistent national pool of assessment tasks does not exist. In selecting national tasks for VET-LSA during the workshop, the experts draw on final examination tasks from the States of Vienna, Upper Austria, and Vorarlberg on the one hand. On the other hand some tasks were contributed by the participation representatives from the VET schools. After selecting the tasks, the experts were quite satisfied with the chosen set of assessment tasks. They expressed their view that it was a representative set of tasks comprising all important core areas of the selected programme and it could also serve as a consistent basis for common apprenticeship final exams (Lehrabschlussprüfung) in all Federal States thus promoting national convergence.

The participants of the first national workshop rated the chosen 10 national assessment tasks after the workshop electronically by email. The additional 3 ratings with representatives from training companies were conducted by personal interviews, in which the VET-LSA feasibility study and its purpose as well as the selection process of occupational tasks, qualification requirements and national assessment tasks was explained to the experts first.

Rating results of National assessment tasks

Educational objectives at the end of VET	Nr.	Assessment tasks	The task is representing major educational objectives at the end of Electricians (craft sector)!				
			strongly disagree (1)	disagree	agree	strongly agree (4)	MEAN
	4	<i>Electrical circuits and switching</i>	0	0	1	9	3,9
	3	<i>Intercom system including door opener</i>	0	0	2	8	3,8
	8	<i>Motor feed line</i>	0	0	2	8	3,8
	9	<i>Inspection of equipment, documentation</i>	0	0	2	8	3,8
	1	<i>Building automation: EIB (practice)</i>	0	1	1	8	3,7
	2	<i>Building automation: EIB (theory)</i>	0	0	3	7	3,7
	10	<i>Technology of measurement</i>	0	0	5	5	3,5
	6	<i>Heating control</i>	0	1	4	5	3,4
Occupational tasks required in the labour market	Nr.	Assessment tasks	How relevant is the task for successful performance of Electricians (craft sector) in the labour market?				
			not relevant (1)	somewhat relevant	relevant	very relevant (4)	MEAN
	4	<i>Electrical circuits and switching</i>	0	0	1	9	3,9
	3	<i>Intercom system including door opener</i>	0	0	2	8	3,8
	6	<i>Heating control</i>	0	0	2	8	3,8
	8	<i>Motor feed line</i>	0	0	2	8	3,8
	9	<i>Inspection of equipment, documentation</i>	0	0	2	8	3,8
	1	<i>Building automation: EIB (practice)</i>	0	1	1	8	3,7
	2	<i>Building automation: EIB (theory)</i>	0	1	3	6	3,5
	7	<i>Loading unit for trucks</i>	0	0	6	4	3,4
	10	<i>Technology of measurement</i>	0	0	6	4	3,4
	5	<i>Lighting engineering</i>	0	1	6	3	3,2

Level of complexity	Nr.	Assessment tasks	Indicate the level of complexity! (level 1 little complexity, level 5 high complexity)					
			1	2	3	4	5	MEAN
	9	Inspection of equipment, documentation	0	0	1	6	3	4,2
	6	Heating control	0	0	3	3	4	4,1
	7	Loading unit for trucks	0	0	3	3	4	4,1
	1	Building automation: EIB (practice)	0	0	4	2	4	4,0
	2	Building automation: EIB (theory)	0	0	6	2	2	3,6
	10	Technology of measurement	0	1	5	2	2	3,5
	8	Motor feed line	0	2	5	3	0	3,1
	5	Lighting engineering	1	3	1	5	0	3,0
Likelihood to master the task successfully	4	Electrical circuits and switching	0	5	3	1	1	2,8
	3	Intercom system including door opener	3	1	5	1	0	2,4
	Nr.	Assessment tasks	Indicate your perceived likelihood that students are able to successfully master the task successfully! (level 1 not at all likely, level 5 extremely likely)					
			1	2	3	4	5	MEAN
	3	Intercom system including door opener	0	0	0	3	7	4,7
	4	Electrical circuits and switching	0	0	0	6	4	4,4
	8	Motor feed line	0	1	3	3	3	3,8
	1	Building automation: EIB (practice)	1	2	1	2	4	3,6
	2	Building automation: EIB (theory)	0	1	5	1	3	3,6
	9	Inspection of equipment, documentation	0	2	3	4	1	3,4
	5	Lighting engineering	0	3	3	3	1	3,2
	7	Loading unit for trucks	0	2	6	0	2	3,2
	6	Heating control	0	3	4	2	1	3,1
	10	Technology of measurement	1	3	2	2	2	3,1

Discussion about rating results of national tasks (second Workshop)

In the course of the interviews with representatives from training firms following Workshop I, one interesting problem concerning the two selected national assessment tasks in the field of Bus engineering (EIB, KNX) came up. Two interviewees, both owner of training firms in Vienna and member of the Viennese State Guild, asserted that Building automation is not an educational objective of the chosen 3.5 year apprenticeship VET programme. According to the corresponding curriculum (“Ausbildungsordnung”), only basic knowledge in the field of Building Automation is part of the programme and the Viennese experts stated that students with this kind of basic knowledge are not able to successfully master the two tasks. The required knowledge and skills are taught only to apprentices of the four year

electrical engineering programme which provides a specialisation in steering systems and bus engineering.¹⁷

Please note: These two Viennese experts rated the two tasks with regard to the 4 year apprenticeship programme (saying that for the 3.5 year programme the tasks were not applicable).

There seems to be regional differences between the states regarding this special issue, which is also very important for the success of a VET-LSA, since building automation is an important core area also in the field of Electrician Craft. Some experts found that there is a gap between the eastern and western States.

In Vienna, and probably in other states too,¹⁸ bus engineering is not as prevalent as it is for example in the western State Tyrol. The Tyrolean expert (owner of a training company and member of the Tyrolean Guild) said that the two selected national EIB-tasks are quite “normal” and that students of the 3.5 year programme get also prepared to master such tasks. Moreover, more than 50% of the apprentices in Tyrol are enrolled in the 4 year programme specialising in steering systems and bus engineering, whereas this percentage is much lower in Vienna. The existing gap is mainly due to occupational tasks at the workplace: bus engineering is not very common in Vienna (maybe due to the dominance of old and historical buildings) and so most apprentices usually never have to do with such tasks in the whole programme. In Tyrol in contrast even private residential buildings are very often equipped with bus technologies such as KNX etc. The training school compensates for this regional occupational differences to some extent by imparting basic knowledge in building automation. As aforementioned, this basic knowledge is insufficient to master the assessment tasks.

For the purpose of the VET-LSA one has to bear in mind that the curricula (“Ausbildungsordnungen”) for all electrical apprenticeship programmes, which are a national law, are completely redesigned at the moment. The new curriculum will emphasise bus engineering and steering systems for all, so that all students in all Federal States will have more or less the same knowledge, skills and competencies in the field of steering systems and bus engineering. The redesigned curriculum is expected to come into effect not before the year 2010, so the first graduates will enter the labour market after 2014.

¹⁷ Students can either decide to begin with the longer 4 year programme or to “upgrade” to it after finishing the 3.5 year programme (usually only well performing students). The additional half year is then dedicated for specialisation in steering systems and bus engineering.

¹⁸ The four experts representing the firm side came from Vienna, Upper Austria and Tyrol, and the six experts representing training schools came from Vienna, Upper Austria, Lower Austria, Burgenland and Carinthia. So Experts from 6 out of 9 Austrian States are represented in the Feasibility study.

Again, participants of WS II stated their common sense, that practical assessment tasks are needed to assess the VET programmes in crafts properly (since 80% of training is workplace-based). In their view, only a (mere) part of the programme-outcomes can be covered and assessed adequately through simulation (Following the tenor of the participants, there is a gap between theoretical knowledge and practical application in a work scenario).

Discussion of international assessment tasks

Since the final selection of international assessment tasks took place after the second Austrian Workshop, there was only a short discussion about the preliminary list which consisted of 5 tasks (3 German and 2 Austrian national tasks). Some experts mentioned that the proposed German EIB-task (Task 11, core area Building Automation) was too difficult to be mastered by most Austrian students.

In general, the proposed international assessment tasks were rated as major educational objectives. The mean of only two tasks is lower than 3.

Especially one of the Rating results of international assessment tasks show a gap between experts from the workplace and experts from schools (see also above): Two Workplace-experts strongly disagreed, that Task 11 is a major educational objective, and the third gave no answer to that item. In contrast, the other experts from schools agreed (2) or strongly agreed (5). Task 5 and Task 6 (both Drive Technology) have the lowest mean-ratings (and a high dispersion) and were rated quite unanimous as rather complex tasks.

Regarding complexity, the proposed tasks show a good variance: the mean-rating ranges from 1.8 to 3.8.

Rating of international assessment tasks

The task is representing major educational objectives at the end of VET programmes Electricians	strongly disagree (1)	disagree	agree	strongly agree (4)	no answer	MEAN
TASK 1: Installation technology	0	0	2	8	0	3,8
TASK 2: Installation technology	0	0	2	8	0	3,8
TASK 3: Control technology	0	1	6	3	0	3,2
TASK 4: Control technology	0	0	4	6	0	3,6
TASK 5: Drive technology	2	2	2	3	1	2,7
TASK 6: Drive technology	2	3	1	3	1	2,6
TASK 7: Drive technology	0	0	2	8	0	3,8
TASK 8: Drive technology	0	1	5	4	0	3,3
TASK 9: Illumination	1	1	3	4	1	3,1
TASK 10: Illumination	0	0	2	8	0	3,8
TASK 11: Building Automation	2	0	2	5	1	3,1
TASK 12: Measurement technology	0	0	0	10	0	4,0
TASK 13: Troubleshooting	0	0	1	9	0	3,9
TASK 14: Installation technology	0	0	3	7	0	3,7

Indicate the level of complexity! (level 1: little complexity to level 4: high complexity)	1	2	3	4	no answer	MEAN
TASK 1: Installation technology	1	0	8	1	0	2,9
TASK 2: Installation technology	2	4	4	0	0	2,2
TASK 3: Control technology	0	2	5	3	0	3,1
TASK 4: Control technology	0	0	2	8	0	3,8
TASK 5: Drive technology	0	0	4	4	2	3,5
TASK 6: Drive technology	0	0	4	4	2	3,5
TASK 7: Drive technology	0	4	5	1	0	2,7
TASK 8: Drive technology	0	4	5	1	0	2,7
TASK 9: Illumination	0	0	5	2	3	3,3
TASK 10: Illumination	2	7	1	0	0	1,9
TASK 11: Building Automation	0	1	2	5	2	3,5
TASK 12: Measurement technology	0	0	4	6	0	3,6
TASK 13: Troubleshooting	1	3	4	2	0	2,7
TASK 14: Installation technology	3	6	1	0	0	1,8

Austrian rating results compared to international results

Compared to international rating results, several characteristics have to be mentioned at the national level, especially the dispersion of the ratings should be taken into consideration. Regarding the *relevance of occupational tasks*, the rating results of Austrian experts showed the highest dispersion (measured by mean absolute deviation, MAD) in half of the 12 items, compared to the other countries. In two additional tasks, the MAD equals 1.0, which is also considerably high in a rating scale with 5 response options. 4 items, which have the highest MAD in Austria, are rated significantly lower than the overall mean of country means:

- No. 1: Plan layout and installation of electrical wiring, equipment and fixtures, based on job specifications and local codes (Austrian mean: 3.9 vs. mean of country means: 4.4).
- No. 4: Observe and test operation of appliances following installation, and make any initial installation adjustments that are necessary (3.6 vs. 4.1).
- No. 10: Fasten small metal or plastic boxes to walls to house electrical switches or outlets (3.1 vs. 4.2).
- No. 11: Refer to schematic drawings, product manuals, and trouble-shooting guides in order to diagnose and repair problems (3.3 vs. 4.1).

Task 10 was rated very low by representatives from training enterprises. Nevertheless, from their point of view it is a task that is very often performed. The reason for the low rating of relevance is that the task was regarded as a too specific and simple, and can be subsumed in other tasks as well. On contrary, task 6 (*Inspect electrical systems, equipment, and components to identify hazards, defects, and the need for adjustment or repair, and to ensure compliance with codes*), which also has the highest dispersion in Austria, was rated unanimously high by the experts from training firms. Regarding the *frequency of the occupational tasks*, the Austrian rating was more concordant: only item No. 11 shows a considerable lower rating than the mean of country means.

3 qualification requirements were significantly rated more relevant in the Austrian context and 2 qualification requirements were rated as lower relevance:

- No. 2: Telecommunications - Knowledge, skills, and abilities of transmission, broadcasting, switching, control, and operation of telecommunications systems; e.g. call systems, equipment of telecommunication and telephone systems, aerials, hazard alert systems (Austrian mean: 4.4 vs. mean of country means: 3.6).
- No. 4: Computers and Electronics - Knowledge, skills, and abilities of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming (3.2 vs. 2.7).

- No. 6: Mathematics - Knowledge, skills, and abilities of arithmetic, algebra, geometry, calculus, statistics, and their applications (2.4 vs. 2.9).
- No. 7: Physics - Knowledge, skills, and abilities of prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub- atomic structures and processes (1.7 vs. 2.5).
- No. 8: English Language - Knowledge, skills, and abilities of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar (3.9 vs. 3.1).

Experts asserted that basic knowledge in Mathematics and Physics (items No. 6 & 7) is very relevant indeed, but the items refer rather to advanced knowledge and this resulted in a comparatively low rating.

Regarding the dimension “major educational objective” of *international assessment tasks*, the national mean of only 3 tasks (out of 14) show a significant deviation from the mean of country means. The tasks

- No. 7: Drive Technology
- No. 9: Illumination
- No.12: Measurement Technology

were rated higher in Austria than in most other countries. 5 items had the highest MAD on the national level. Task 11 (Building automation) was rated very low by two experts from training companies (the third one marked „no answer“, see chapter 2.2.3 for a discussion). Austrian experts agreed on the level of complexity to a large extent: the dispersion of the ratings is rather low. Moreover the list of selected international assessment tasks seems to cover a good range of simple, medial and complex tasks.

Elisabeth Riebenbauer und Peter Slepcevic (University of Graz)

2.3. Business & Administration

Methods for data collection:

The national expert first selected 10 assessment tasks out of current school and apprenticeship leaving exams. They were then assessed by the participants during the 1st workshop. The tasks cover the following topics:

- Calculation, economic system, legal form, inventory control, record booking,
- bid comparison, billing, marketing, operating income.

Two assessment tasks (calculation, economic system) were replaced after the workshop by two new ones (calculation, letter of complaints) and were rated via email in December 2008.

As the final international set of assessment tasks of all countries was not completed at the time of the 2nd workshop, the participants could assess only 5 tasks from Austria and 6 tasks from Germany, which were in discussion to be part of this final international set. After completion, the final international set of 14 assessment tasks was sent to the participants at the beginning of March. All 13 participants rated and returned them by email in March.

As the VET programme “Bürokaufleute” (office clerk) is very important next to the VET programme “Industriekaufleute” (industrial clerk) in Austria, both programmes were considered for the Feasibility Study. For both of them the qualification can be acquired either with the dual system (apprenticeship) or with a full-time business school.

2.3.1. General information on the VET programme “

title of VET programme	apprenticeship education (Lehre): -office assistant (Bürokaufmann/-frau) -industry office assistant (Industriekaufmann/frau) VET school: -Business school (Handelsschule) -School of management and service industries (Fachschule für wirtschaftliche Berufe)
total duration (years)	3 years (apprenticeship education starting at 10 th grade and VET school starting at 9 th grade)
number of students (in 2007) - total number graduates - male/female - reference (national statistics)	Bürokaufmann/-frau: 6.854 (♂ 1.391; ♀ 5.463) Industriekaufmann/-frau: 720 (♂ 158; ♀ 562) Handelsschule: 12.167 (♂ 5.111; ♀ 7.056) Fachschule für wirtschaftliche Berufe 9.441 (♂ 1.246; ♀ 8.195) (Source: WKO, Statistics Austria)
ISCED level	ISCED level 3B
Entry requirements - formal - actual/common	<i>Formal entry requirements:</i> apprenticeship education: completion of 9 years of compulsory school VET school: positive completion of lower secondary schooling
access to next level of education/training	Examination for the master craftsman's certificate Vocational matriculation examination Certificate of General Educational Development
Organisation/learning arrangements training workplace (%)..... training school/training centre (%)..... - alternating programme - periods of training in school/ - training centre and at the workplace	<i>Organisation/learning arrangements:</i> Training workplace: apprenticeship education: 80%; VET school: 0% Training school: apprenticeship education: 20%; VET school: 100% <i>Alternating programme:</i> apprenticeship education vocational school (all-the-year): one day a week in school, four days on workplace vocational school (course): at least 8 weeks school, rest of the year on workplace vocational school (season): a specific season, rest of the year on workplace

2.3.2. Occupational Tasks and Qualification Requirements

Rating Occupational tasks

Nr.	Occupational task (O*NET task descriptors)	How <u>relevant</u> is the task on average to the performance of jobs in the field of “Business and Administration”? (<i>not relevant (1) – extremely relevant (5)</i>)					
		1	2	3	4	5	MEAN
1	Analyze and monitor sales records, trends and economic conditions to anticipate consumers buying patterns and determine what the company will sell and how much inventory is needed (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products).	0	5	2	2	2	3,1
2	Research and evaluate suppliers based on price, quality, selection, service, support, availability, reliability, production and distribution capabilities, and the supplier's reputation and history (13-1023.00 - Purchasing Agents, Except Wholesale, Retail, and Farm Products).	0	1	1	2	7	4,4
3	Respond to customer and supplier inquiries about order status, changes, or cancellations (43-3061.00 - Procurement Clerks). Track the status of requisitions, contracts, and orders (43-3061.00 - Procurement Clerks).	0	0	0	0	12	5,0
4	Set up cost monitoring and reporting systems and procedures (13-1051.00 – Cost Estimators).	8	0	0	0	0	1,0
5	Review files, records, and other documents to obtain information to respond to requests (43-9061.00 – Office Clerks, General). Review requisition orders in order to verify accuracy, terminology, and specifications (43-3061.00 - Procurement Clerks).	0	0	5	2	5	4,0
6	Prepare invoices, reports, memos, letters, financial statements and other documents, using word processing, spreadsheet, database, or presentation software (43-6011.00 - Executive Secretaries and Administrative Assistants). Collect, count, and disburse money, do basic bookkeeping, and complete banking transactions (43-9061.00 – Office Clerks, General) Enter data into computers for use in analyses and reports (43-9111.00 - Statistical Assistants).	0	0	1	1	10	4,8
7	Monitor and follow applicable laws and regulations (13-1023.00 - Purchasing Agents, Except Wholesale, Retail, and Farm Products).	0	4	2	2	3	3,4
8	Supervise the work of office, administrative, or customer service employees to ensure adherence to quality standards, deadlines, and proper procedures, correcting errors or problems (43-1011.00 – First – Line Supervisors/ Managers of Office and Administrative Support workers). Review work done by others to check for correct spelling and grammar, ensure that company format policies are followed, and recommend revisions (43-6014.00 – Secretaries, Except Legal, Medical, ad Executive).	0	3	5	2	2	3,3
9	Collaborate with other departments as necessary to meet customer requirements, to take advantage of sales opportunities or, in the case of shortages, to minimize negative impacts on a business (13-1081.00 – Logisticians). Attend company meetings to exchange product information and coordinate work activities with other departments. (41-1012.00 – First – Line Supervisors/ Managers of Non – Retail Sales Workers).	0	2	3	3	4	3,8
10	accomplish calculations (new occupational task)	0	0	1	8	2	4,1

Nr.	Occupational tasks (O*NET task descriptors)	How <u>often</u> is the task performed? (several times a year (1) – several times daily (5))					
		1	2	3	4	5	MEAN
1	Analyze and monitor sales records, trends and economic conditions to anticipate consumers buying patterns and determine what the company will sell and how much inventory is needed (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products).	3	2	2	0	0	1,9
2	Research and evaluate suppliers based on price, quality, selection, service, support, availability, reliability, production and distribution capabilities, and the supplier's reputation and history (13-1023.00 - Purchasing Agents, Except Wholesale, Retail, and Farm Products).	1	5	2	0	1	2,4
3.	Respond to customer and supplier inquiries about order status, changes, or cancellations (43-3061.00 - Procurement Clerks). Track the status of requisitions, contracts, and orders (43-3061.00 - Procurement Clerks).	0	3	2	2	4	3,6
4	Set up cost monitoring and reporting systems and procedures (13-1051.00 – Cost Estimators).	1	0	0	0	0	1,0
5.	Review files, records, and other documents to obtain information to respond to requests (43-9061.00 – Office Clerks, General). Review requisition orders in order to verify accuracy, terminology, and specifications (43-3061.00 - Procurement Clerks).	0	1	1	5	1	3,8
6.	Prepare invoices, reports, memos, letters, financial statements and other documents, using word processing, spreadsheet, database, or presentation software (43-6011.00 - Executive Secretaries and Administrative Assistants). Collect, count, and disburse money, do basic bookkeeping, and complete banking transactions (43-9061.00 – Office Clerks, General) Enter data into computers for use in analyses and reports (43-9111.00 - Statistical Assistants).	0	0	3	1	7	4,4
7	Monitor and follow applicable laws and regulations (13-1023.00 - Purchasing Agents, Except Wholesale, Retail, and Farm Products).	0	0	1	3	4	4,4
8.	Supervise the work of office, administrative, or customer service employees to ensure adherence to quality standards, deadlines, and proper procedures, correcting errors or problems (43-1011.00 – First – Line Supervisors/ Managers of Office and Administrative Support workers). Review work done by others to check for correct spelling and grammar, ensure that company format policies are followed, and recommend revisions (43-6014.00 – Secretaries, Except Legal, Medical, ad Executive).	0	0	1	3	4	4,4
9.	Collaborate with other departments as necessary to meet customer requirements, to take advantage of sales opportunities or, in the case of shortages, to minimize negative impacts on a business (13-1081.00 – Logisticians). Attend company meetings to exchange product information and coordinate work activities with other departments. (41-1012.00 – First – Line Supervisors/ Managers of Non – Retail Sales Workers).	0	3	2	1	3	3,4
10	accomplish calculations (new occupational task)	2	2	5	0	1	2,6

The following occupational tasks caused problems and discussions during the workshop:

- Some of the tasks cover several operations of different relevance, which caused difficulties for the assessment by the experts.
- The experts noted that simple things are expressed very complicated.
- Item No 4 (Set up cost monitoring and reporting systems and procedures) caused enormous problems, as in the opinion of the experts this is too difficult and not a task of a VET student/alumnus. After a longer discussion of the importance of cost accounting items, the group decided to add a new occupational task: “accomplish calculations”, which was rated as item No 10.

Rating qualification requirements

Nr	Qualification requirements (O*NET knowledge descriptors)	How <u>relevant</u> is the qualification requirement for jobs in the field of Business & Administration? (not relevant (1) – extremely relevant (5))					
		1	2	3	4	5	MEAN
1	Clerical — Knowledge, skills and abilities of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology. (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products) & (13-1023.00 - Purchasing Agents, Except Wholesale, Retail, and Farm Products) & (43-6011.00 Executive Secretaries and Administrative Assistants)	0	0	1	3	8	4,6
2	Administration and Management — Knowledge, skills and abilities of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products) & (13-1023.00 - Purchasing Agents, Except Wholesale, Retail, and Farm Products) & 43-3061.00 Procurement Clerks & (43-9111.00 Statistical Assistants) & (43-6011.00 Executive Secretaries and Administrative Assistants).	1	4	5	0	2	2,8
3	Economics and Accounting — Knowledge, skills and abilities of economic and accounting principles and practices, the financial markets, banking and the analysis and reporting of financial data (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products) & (13-1023.00 - Purchasing Agents, Except Wholesale, Retail, and Farm Products).	1	8	0	2	1	2,5

4	Production and Processing — Knowledge, skills and abilities of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods (13-1023.00 - Purchasing Agents, Except Wholesale, Retail, and Farm Products) & (13-1051.00 Cost Estimators).	1	6	3	2	0	2,5
5	Customer and Personal Service — Knowledge, skills and abilities of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction. (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products) & (41-3031.01 Sales Agents, Securities and Commodities) & (43-9111.00 Statistical Assistants) & (43-6011.00 Executive Secretaries and Administrative Assistants).	0	3	1	4	4	3,8
6	Sales and Marketing — Knowledge, skills and abilities of principles and methods for showing, promoting, and selling products or services. This includes marketing strategy and tactics, product demonstration, sales techniques, and sales control systems. (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products) & (41-3031.01 Sales Agents, Securities and Commodities)	0	2	2	7	1	3,6
7	Transportation — Knowledge, skills and abilities of principles and methods for moving people or goods by air, rail, sea, or road, including the relative costs and benefits (13-1081.00 – Logisticians).	0	2	7	2	1	3,2
8	Law and Government — Knowledge, skills and abilities of laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules, and the democratic political process.	1	4	5	1	0	2,6
9	Education and Training — Knowledge, skills and abilities of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects (13-1081.00 – Logisticians).	6	5	1	0	0	1,6
10	National Language — Knowledge, skills and abilities of the structure and content of the national language including the meaning and spelling of words, rules of composition, and grammar (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products).	0	0	1	1	10	4,8
11	Computers and Electronics — Knowledge, skills and abilities of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming (13-1081.00 – Logisticians).	0	3	2	4	2	3,5
12	Mathematics — Knowledge, skills, and abilities of arithmetic, algebra, geometry, calculus, statistics, and their applications (13-1022.00 - Wholesale and Retail Buyers, Except Farm Products).	4	1	6	0	0	2,2
13	Case Management – Knowledge, skills and abilities to take over independent responsibility for cases such as coordinator, project secretary (these functions are lacking in the O*NET descriptors).	1	3	5	3	0	2,8
14	Communication: ability to communicate target-orientated with adequate communication technology (new)	0	0	1	3	7	4,6
15	Social competence and problem solving ability. (new)	0	0	1	3	6	4,5

The qualification requirements were formulated clearer for the workshop participants. However they missed items concerning the use of communication technology and concerning soft skills. The group added and rated two new knowledge descriptors:

- Communication: ability to communicate target-orientated with adequate communication technology (item No 14),
- Social competence and problem solving ability (item No 15).

2.3.3. *Level of performance at the end of VET*

Rating of national assessment tasks

The national expert first selected 10 assessment tasks out of current school leaving exams of the 3-year Business School and of apprenticeship leaving exams (theoretical and practical part). All tasks include at least one record/document (*Belege*) and are based on a working case or concrete situation. No pure theoretical questions are included.

These national set was then assessed by the participants during the 1st workshop. Two assessment tasks (calculation, economic system) were replaced after the workshop by two new ones (calculation, letter of complaints), which were rated via email in December 2008.

Rating of assessment tasks

Educational objectives at the end of VET	Nr.	Assessment tasks	The task is representing major educational objectives at the end of business administration! (strongly disagree (1) – strongly agree (4))					
			1	2	3	4	MEAN	
	7	comparison of bids	0	0	0	12	4,0	
	11	cost accounting (new)	0	0	0	8	4,0	
	12	notification of defects (new)	0	0	0	8	4,0	
	8	billing	0	0	1	11	3,9	
	1	cost accounting	0	0	2	10	3,8	
	4	inventory	0	0	2	9	3,8	
	5	record booking (purchase invoice, cash record)	0	0	2	9	3,8	
	6	record booking (book, fuel)	0	0	4	8	3,7	
	9	marketing	0	1	3	8	3,6	
	3	legal form of a company	1	0	7	4	3,2	
	10	operating income	0	3	9	0	2,8	
	2	economic system	1	3	7	1	2,67	

Occupational tasks required in the labour market	Nr.	Assessment tasks	How relevant is the task for successful performance of business administration in the labour market? <i>(not relevant (1) – very relevant (4))</i>				
			1	2	3	4	MEAN
	7	<i>comparison of bids</i>	0	0	0	11	4,0
	8	<i>billing</i>	0	0	1	10	3,9
	11	<i>cost accounting (new)</i>	0	0	1	7	3,9
	12	<i>notification of defects (new)</i>	0	0	2	6	3,8
	1	<i>cost accounting</i>	0	0	6	5	3,5
	4	<i>inventory</i>	0	2	3	6	3,4
	6	<i>record booking (book, fuel)</i>	0	1	5	5	3,4
	5	<i>record booking (purchase invoice, cash record)</i>	0	2	4	5	3,3
	9	<i>marketing</i>	0	2	5	4	3,2
	3	<i>legal form of a company</i>	0	6	3	2	2,6
	10	<i>operating income</i>	0	4	7	0	2,6
	2	<i>economic system</i>	1	9	0	1	2,1

Level of complexity	Nr.	Assessment tasks	Indicate the level of complexity! (level 1 little complexity, level 5 high complexity)					
			1	2	3	4	5	MEAN
	11	<i>cost accounting (new)</i>	0	0	2	5	1	3,9
	12	<i>notification of defects (new)</i>	0	1	2	2	3	3,9
	10	<i>operating income</i>	0	1	3	4	3	3,8
	7	<i>comparison of bids</i>	0	0	6	2	3	3,7
	4	<i>inventory</i>	0	0	6	4	1	3,6
	9	<i>marketing</i>	0	2	2	6	1	3,6
	2	<i>economic system</i>	1	1	3	4	2	3,5
	8	<i>billing</i>	0	4	2	1	4	3,5
	3	<i>legal form of a company</i>	0	3	4	1	3	3,4
	6	<i>record booking (book, fuel)</i>	0	4	2	3	2	3,3
	5	<i>record booking (purchase invoice, cash record)</i>	0	5	1	3	2	3,2
	1	<i>cost accounting</i>	0	3	4	4	0	3,1

Likelihood to master the task successfully	Nr.	Assessment tasks	Indicate your perceived likelihood that students are able to master the task successfully! (level 1 not at all likely, level 5 extremely likely)					
			1	2	3	4	5	MEAN
	8	<i>billing</i>	0	0	2	5	4	4,2
	5	<i>record booking (purchase invoice, cash record)</i>	0	0	2	6	3	4,1
	6	<i>record booking (book, fuel)</i>	0	0	4	4	3	3,9
	12	<i>notification of defects (new)</i>	0	0	3	4	1	3,8
	4	<i>inventory</i>	0	0	4	6	1	3,7
	7	<i>comparison of bids</i>	0	0	4	6	1	3,7
	9	<i>marketing</i>	0	1	5	4	1	3,5
	11	<i>cost accounting (new)</i>	0	0	6	1	1	3,4
	1	<i>cost accounting</i>	0	0	7	4	0	3,4
	10	<i>operating income</i>	0	5	5	1	0	2,6
	3	<i>legal form of a company</i>	2	2	6	1	0	2,6
	2	<i>economic system</i>	1	8	2	0	0	2,1

Rating international assessment tasks

The final international set was rated via email by all 13 participants of the 2nd workshop in March, as it was not completed at the time of the 2nd workshop in Austria (End of January).

Seven participants of the 2nd workshop made additional comments of the email-rating. They are part of the appendix at the end of this report (only in German). Additional comments generally concern the following problems, e.g.:

- Some terms are not known respectively not common in Austria, e.g. “secondary demand/ Sekundärbedarf”, or wrong, e.g. Celjetown.
- The translation should be proofed again for some sentences. Writing and spelling mistakes are included.
- Some sentences are formulated very theoretical or too schoolish/schooling.
- Some exam questions must be more concrete that students know what to do with it, e.g. 3.1, 3.2, 3.5, 5.1, 7.
- Some introductory texts are too long, e.g. 2.3.
- Some contents are not part of the VET programmes in Austria, e.g. customer service, sales situations – they are part of the programme for retailer etc.
- Some tasks are fairly complex and complicated – maybe too difficult for that level, e.g. 1.1, 5.1.
- Some tasks are very difficult to assess/rate – different levels of learning targets, e.g. 1.1.
- Some tasks it would be desirable to design them more practical, e.g. to include a real working situation or original documents (*Belege*).

Educational objectives at the end of VET	Nr	Assessment tasks	The task is representing major educational objectives at the end of business admin. (strongly disagree (1) – strongly agree (4)) 0: no answer					
			1	2	3	4	0	MEAN
	1.1	<i>Hazelnutz</i>	1	6	5	0	0	2,3
	2.1	<i>Fashionable sports clothes</i>	0	0	4	8	0	3,7
	2.2	<i>Selection and order of light boxes</i>	0	0	2	10	0	3,8
	2.3	<i>Marsh mellows light</i>	3	5	1	3	0	2,3
	3.1	<i>Customer marketing</i>	3	2	3	2	2	2,4
	3.2	<i>Customer service</i>	2	3	4	1	2	2,4
	3.3	<i>Preparing conversation with customers</i>	2	4	2	4	0	2,7
	3.4	<i>Exploring customers consuming wishes and needs</i>	2	5	3	2	0	2,4
	3.5	<i>Complete business process about placement of orders/customer consulting</i>	2	3	3	3	1	2,6
	4.1	<i>Invoicing of services and goods by letter writing and bank transactions</i>	0	0	1	11	0	3,9
	5.1	<i>Planning and follow-up of an enterprise`s finace</i>	5	6	0	0	1	1,5
	5.2	<i>Drafting a non-adressed advertising letter</i>	0	0	4	8	0	3,7
	6.1	<i>Verification of ongoing orders and sales-transactions</i>	0	0	2	10	0	3,8
	7.1	<i>Correspondence in a foreign language and its verification by respective applicable law</i>	1	3	8	0	0	2,6

	Nr.	Assessment tasks	Indicate the level of complexity! (level 1 little complexity, level 4 high complexity) 0: no answer					
			1	2	3	4	0	MEAN
Level of complexity	1.1	<i>Hazelnutz</i>	0	1	6	4	1	3,3
	2.1	<i>Fashionable sports clothes</i>	0	5	5	2	0	2,8
	2.2	<i>Selection and order of light boxes</i>	0	4	5	3	0	2,9
	2.3	<i>Marsh mellows light</i>	0	1	3	7	1	3,5
	3.1	<i>Customer marketing</i>	1	3	1	2	5	2,6
	3.2	<i>Customer service</i>	1	2	3	1	5	2,6
	3.3	<i>Preparing conversation with customers</i>	4	4	2	1	1	2,0
	3.4	<i>Exploring customers consuming wishes and needs</i>	1	6	2	1	2	2,3
	3.5	<i>Complete business process about placement of orders/customer consulting</i>	0	0	4	6	2	3,6
	4.1	<i>Invoicing of services and goods by letter writing and bank transactions</i>	0	4	6	2	0	2,8
	5.1	<i>Planning and follow-up of an enterprise`s finace</i>	0	1	1	8	2	3,7
	5.2	<i>Drafting a non-adressed advertising letter</i>	1	6	5	0	0	2,3
	6.1	<i>Verification of ongoing orders and sales-transactions</i>	0	6	5	1	0	2,6
	7.1	<i>Correspondence in a foreign language and its verification by respective applicable law</i>	0	6	5	1	0	2,6

3. Summary and conclusions

3.1. National characteristics of expert ratings for each vocational area

3.1.1. *Carmechatronics*

The occupational field of Carmechatronics is a comparably homogenous one. The mean absolute deviation within country means of means only seldom climbs over 0,5 but most times does not reach more than 0,3 on a scale with 4 to 5 response options.

The rating results of Austria perfectly fit into this picture of homogeneity. Only in very rare occasions the Austrian ratings are on top or at the bottom of the country ratings but most times near the mean.

Concerning the qualification requirement ‘national language’ the Austrian experts rank its relevance higher than the experts of all other countries. This can be explained with the fact that in Austria a large proportion of apprentices in the occupational field of Carmechatronics have got a migrant background and face specific language-difficulties. Therefore special attention has to be drawn on the formulation of assessment tasks and the sampling of test persons.

3.1.2. *Electrician*

In the field of Electrician (craft sector), the rating results show that there is a common agreement among Austrian experts. However, differing rating results of *occupational tasks* show that some items lead to controversial views and do not picture the Austrian situation of relevant and frequent tasks in a unequivocal way. Regarding *qualification requirements*, Austrian experts agreed on their relevance to a large extent.

The ratings of the *national assessment tasks* show a high concordance with a relatively low level of dispersion concerning the dimensions “major educational objective” and “relevance for successful labour market performance”. Some differences appear for the two dimensions “complexity” and “perceived likelihood”. Also, the set of *international assessment tasks* was rated similar within Austria experts: the dispersion of the ratings is rather low. Moreover the list of selected international assessment tasks seems to cover a good range of simple, medial and complex tasks.

Overall, the rating results of Austrian Electrician experts in the craft sector show that the field is a comparable one. The deviations regarding the ratings of occupational tasks (compared to the international mean as well as within the country) point to

some amount of discordance among Austrian experts. Nevertheless, the results of the feasibility study allow for a future VET-LSA, as there is a broad concordance regarding the assessment tasks in particular and the qualification requirements as well. The finding of the feasibility study should be very helpful for designing test instruments in a possible VET-LSA.

3.1.3. *Business and Administration*

The rating results of the vocational area Business & Administration show that there is a common agreement among Austrian experts. However, the field of business offers several characteristics from a national perspective, which leads to varying requirements for the apprentices or students regarding to the company they work or will work with (e.g. in private or public sector, for small or large company). This fact explains the dispersion of the national ratings for occupational tasks and qualification requirements. The Austrian country means agree widely with the other countries, except for occupational task No. 4 (*set up cost monitoring systems*) – it was dropped from the list in Austria. As this item was replaced by a new formulation, and an item for *communication* was added on the international level, a common agreement for all items remains.

The national set of assessment tasks shows a high concordance, especially after a second email-rating of two additional tasks. The Austrian rating results for the international set of assessment tasks show larger deviations from other countries for several items. The main reason for that is due to the unequal range of the tasks, e.g. five tasks (out of 14) are concerning *sales*, which is not included in the Austrian programme in this extent. Austrian experts also dislike the inaccurate formulation, kind and level of the questioning within some tasks (see Appendix II, 5.3.1) and ask for tasks based on a concrete working situation or process and including original material. As the experts at the international meeting in Bonn in May agreed on six core areas for Business & Administration (purchasing, sales & marketing, financials & accounting, stock keeping, customer service, organisational activities) and the fact that all these areas should be included in the international set to the same extent, this problem should be solved.

3.2. **Recommendation for VET-LSA from the national perspective**

The purpose of the feasibility study has been, to explore the selected occupational fields in terms of comparability across the eight European countries. As a first step specific programmes have been chosen for each field for comparison. In Austria the apprenticeship system and the VET-schools cover the targeted level of competences, thus in two of the fields – electricians and business/administration – both types of programmes have been explored. In car mechatronic only apprenticeship has been

explored. In addition, in the electrician field the decision has been taken, to focus on the craft sector (the fourth field of health services had been excluded from the beginning because of institutional reasons).

Four basic dimensions have been derived from the theoretical concept of competences to assess the variety/similarity of the selected occupational fields across countries/systems: relevance of selected occupational tasks, relevance of selected qualification requirements, representativity of selected assessment tasks for educational objectives, complexity of the selected assessment tasks. For each dimension a set of selected items has been rated by groups of experts from the occupational fields, partly in workshops, partly by email. Overall, the Austrian ratings fit well into the range of country results. As very often in European comparisons, the Austrian results are near to the average.

However, there are also some characteristic deviations of the Austrian results, as compared to the average of involved countries.

- In the field of car mechatronic the Austrian profile is near the average at each dimension, and the majority of positive deviations also indicates that the selected items are indicating the profile of the Austrian programme quite well.
- In the field of electricians only the craft sector has been rated, however, by experts from two different programmes (apprenticeship and VET-schools). Here the rating differs a bit more from the average at two dimensions. The qualification requirements are rated very positively, whereas the relevance of some selected occupational tasks fits less well to the Austrian programme profile. The assessment tasks are rated as representative also.
- In the field of business & administration the deviations are pointing mainly in a negative direction, except the complexity of assessment tasks. In this field the occupational tasks, the qualification requirements and the educational objectives have consistently been rated as being less good descriptors for the Austrian programmes. However, we have to take into account, that in this field the experts from the provider side have been a bit overrepresented.

The pattern of deviations might partly be explained by the greater variety of programmes in the fields that show bigger deviations from the average. Interestingly, the complexity of the selected assessment tasks has been rated comparatively high in each of the fields. This may indicate that the Austrian programmes are providing competences at a comparatively less complex level, if we take the expectations of the experts as a contrasting point of the comparison.

Austrian profile grossly compared to means of country means (mm)

	Car Mechatronic	*Dev. +/-	Electrician (craft)	*Dev. +/-	Business & Administration	*Dev. +/-
Occupational tasks: relevance	Near mean of countries (mm)	5/7	Near mm with exceptions	0/12	Near mm with exceptions	3/5
Qualification requirements: relevance	Near mean of countries (mm)	4/2	More different to mm, mostly within range of countries	6/2	Near mean of countries (mm)	2/8
ASTA educational objectives: representative	Near mean of countries (mm)	9/1	Near mean of countries (mm)	9/1	More different to mm, mostly within range of countries	5/9
ASTA complexity	Near mean of countries (mm)	7/3	Near mean of countries (mm)	9/0	Near mean of countries (mm)	9/2
Summary	Austria near mm and deviations positive		Austria some difference to mm, deviations positive except relevance of occupational tasks		Austria some difference to mm, deviations negative except complexity of assessment tasks	

* Number of positive/negative deviations from the means of country means (mm), remaining items very near the mm

Thus, overall the fields of car mechatronic and electricians can be clearly recommended as being sufficiently homogenous for a comparative assessment. In the field of craft electricians the experts themselves have expressed their surprise about the homogeneity of the comparative results. In the field of business & administration the picture is less clear. However, there seem to be some reasons that the Austrian results diverge so much from the mean of country means. The experts have variously criticised the selection of items, the two different programmes seem to differ, and there were mainly experts from the providers' side, which might have to some extent a more specific opinion.

There have also been some experiences in the course of the study, which might deserve some attention:

- Despite the Austrian VET system is a strongly regulated one, it has proved a bit difficult to find experts at the system level that can provide an overall view about the selected fields. Moreover, there are regional differences within the system, and communication and exchange at the national level is lacking somewhat. Thus experts in some fields have expressed their satisfaction about the opportunity to exchange their experience and opinions during the course of the workshops.
- There is almost no research and formal knowledge about the issues at stake in the study. Thus the issues have been discussed mainly on the basis of informal and

personal knowledge of the experts involved. Lassnigg/Markowitsch (2005)¹⁹ had shown this already in an analysis of the knowledge used in the process of updating the VET programmes in Austria.

- An important point has been that the experts have strongly emphasised in various ways the importance of practical knowledge in their VET provision. Therefore they suspected that the Austrian students might not be very good at more abstract questions and paper and pencil tests. However, it seems to be not so easy to provide examples for those practical competences, and the high degree of satisfaction with the assessment tasks also does a bit contradict this general notion.

Implicitly those observations point to a need of more strongly evidence-based reflection and exchange about the competences provided in relation to the competences needed in the Austrian VET system. A comparative VET-LSA would not only provide valuable insights about the competences acquired, but also feed the ongoing process about competence orientation in VET and how this might be improved by good measurement practices. An important recommendation is therefore, that a broad involvement of experts in the development of the measurement instruments should be envisaged. Thus the development of the VET-LSA could strengthen the exchange of experience among the involved countries about the practices of how outcome orientation can be achieved.

¹⁹ Lassnigg, L.; Markowitsch, J. (eds.) (2005), *Qualität durch Vorausschau. Antizipationsmechanismen und Qualitätssicherung in der österreichischen Berufsbildung*, Studienverlag, Innsbruck-Wien.

4. Appendix I: List of Workshop participants

4.1. Car-Mechatronic

NAME	ORGANISATION / FUNCTION	Workshop-Participation	
		1 st . WS	2 nd . WS
Karl Nusser	Landes-Berufsschule Eggenburg Principal of Vocational School Eggenburg	✓	✓
Josef Stocker	Berufsschule 2 Villach Teacher at Vocational School Villach	✓	✓
Johann Kneisz	Landes-Berufsschule Pinkafeld Teacher at Vocational School Pinkafeld	✓	✓
Markus Fuchs	Berufsschule Kfz-Technik, Wien Teacher at Vocational School Vienna	✓	✓
Alois Fitzka	Wirtschaftsförderungsinstitut, WIFI St. Pölten Further Education/ Training Institution	✓	✓
Werner Fessl	Landesinnungsmeister Wien, Autohausinhaber Employer, Federal Guild - Vienna	✓	✓
Dr. Michael Diglio	HTL Mödling, Abteilungsvorstand KFZ Higher Vocational Education School	✓	X
Franz Peindl	Bezirksinnungsmeister-Hartberg, Autohaus-inhaber (Employer, County Guild – Hartberg)	✓	X
Urs-Martin Merz	INTEA GmbH – Further Education/ Training Institution	X	✓
Georg Ringseis	Landesinnung Wien, Werkstättenbesitzer Employer, Federal Guild - Vienna	X	✓
Karl Heinz Riegl	Landesinnung Wien, Werkstättenbesitzer Employer, Federal Guild - Vienna	X	✓

4.2. Electricians (Craft)

At the first national workshop, 7 experts participated. 6 experts were from VET – schools/colleges (4 of them from VET schools for apprentices) and 1 expert was from the Austrian Federal Economic Chamber.

Following the workshop 3 additional ratings were conducted in the course of interviews with representatives from apprenticing companies, who are also members of state guilds of the Chamber of Commerce.

Nr	Name	Function	Institution	WS I	WS II
1	Gerhard Graf	Headmaster	Vocational school for apprentices Stockerau	✓	✓
2	Ernst Kolleger	Headmaster	Vocational school for apprentices, Vienna	✓	✓
3	Hubert Sabitzer	Teacher	Vocational school for apprentices, Klagenfurt	✓	✓
4	Martin Csebits	Teacher	Vocational school for apprentices, Oberwart	✓	+
5	Christian Bräuer	Employer, member of Viennese state guild	Employer in Vienna, Viennese Chamber of Commerce	+	+
6	Peter Markuzy	Employer, member of Viennese state guild	Employer in Vienna, Viennese Chamber of Commerce	+	+
7	Stefan Praschl	Field of work: World skills international, Euroskills	Institute for educational research (ibw) & Austrian Federal Economic Chamber	✓	✓
8	Reinhard Mayr	Head of department Electrical Engineering	VET school / VET college Wels	✓	✓
9	Valentin Weichsler	Head of department Electrical Engineering	VET school / VET college Hollabrunn	✓	✓
10	Helmut Lentner	Employer, member of the state guild (Lehrlingswart)	Employer in Tirol, Tyrolean Chamber of Commerce	+	✓
11	Alfred Freundlinger	Department education policy	Austrian Federal economic chamber		◦
12	Karin Luomi-Messerer	Researcher	3s-research laboratory		◦
13	Regine Wieser	Researcher	Austrian Institute for Research on Vocational Training (Öibf)		◦
14	Ulrike Zug	Administrator VET schools	Federal Ministry for Education, Arts and Culture		◦

+ did not attend the workshop but participated in the rating-process (in the course of personal interviews)

◦ invited only for the second workshop, did not take part in the rating-process

4.3. Business and Administration

List of participants – 1st national Workshop: 28.11.2008

Gabriele AUREDNIČEK	Wiener Stadtwerke Holding AG, Lehrlingsreferat
Sigrid EDER	Universität Graz - Personalwesen
Johannes FENZ	Landesberufsschule Eisenstadt
Monika FERSTL	Fachschule für wirtschaftliche Berufe
Karl GUTLEDER	BHAK und BHAS Krems
Brigitte JIRSA	Bundeshandelsschule Stockerau
Erich MACHO	BS Kaufleute Wien
Alexander NATTER	Landesberufsschule Bregenz 3
Dietmar OTTOWITZ	Berufsschule 2 Klagenfurt
Franz STAMM	HBLA für wirtschaftliche Berufe und für Mode und Bekleidung
Josef WALLNER	ibw – Institut für Bildungsforschung der Wirtschaft
Ernst ZOLDA	LBS Wiener Neustadt
Elisabeth Riebenbauer	National experts
Peter Slepcevic	

List of participants – 2nd national Workshop: 26.01.2009

Gabriele AUREDNIČEK	Wiener Stadtwerke Holding AG, Lehrlingsreferat
Sigrid EDER	Universität Graz - Personalwesen
Johannes FENZ	Landesberufsschule Eisenstadt
Monika FERSTL	Fachschule für wirtschaftliche Berufe
Karl GUTLEDER	BHAK und BHAS Krems
Brigitte JIRSA	Bundeshandelsschule Stockerau
Hannelore KEMPEL	BMUKK
Erich MACHO	BS Kaufleute Wien
Alexander NATTER	Landesberufsschule Bregenz 3
Dietmar OTTOWITZ	Berufsschule 2 Klagenfurt
Franz STAMM	HBLA für wirtschaftliche Berufe und für Mode und B.
Josef WALLNER	ibw – Institut für Bildungsforschung der Wirtschaft
Ernst ZOLDA	LBS Wiener Neustadt
Elisabeth Riebenbauer	National experts
Peter Slepcevic	

5. Appendix II: National Assessment Tasks

5.1. Car-Mechatronic

5.1.1. National assessment tasks: overview

1. Code name and short English Name of Assessment task,
2. Time for assessment task
3. Type of assessment
 - a) Practical (skill demonstration and explanation, documentation)
 - b) Theoretical (paper and pencil, knowledge test)
4. Process
 - a) diagnosis/trouble shooting or
 - b) maintenance,
 - c) replace/repair
 - d) communication/quality
5. Area
 - a) electronical/electrical
 - b) mechanical/hydraulic
6. mean values of national rating in origin country concerning:
 - a) representiveness of learning outcomes
 - b) relevance in labour market
 - c) complexity
 - d) likelihood of success

Content Area /Country	AUSTRIA
EM engine management and pollutant emmission	1. AUT EM: Engine Compression (Interpret given measurement diagrams and design a sequence of operations to measure compression) 2. 40 minutes 3. theoretical task (paper and pencil) 4. diagnosis / trouble shooting 5. mechanical/hydraulic 6. a) 3,22, b) 3,1, c) 3,9, d) 3,3
BS brake system	1. AUT BS: Air Break (Explain and add missing connections to a given diagram of an air brake) 2. 40 minutes 3. theoretical task (paper and pencil) 4. neither – nor: just knowledge test! 5. electronical/electrical & mechanical/hydraulic 6. a) 1,89, b) 2,1, c) 4,6 , d) 1,4
UC Undercarriage <i>(e.g. suspension,</i> <i>steering, geometry,</i> <i>wheel alignment,</i> <i>...)</i>	1. AUT UC: Axle Measurement (Design a sequence of operations, make practical measurement, explain technical terms) 2. 40 minutes 3. practical & theoretical task 4. maintenance 5. mechanical/hydraulic 6. Note: Example for expert rating was slightly different to PDF-Example) a) 3,44, b) 3,5, c) 3,6, d) 3,4

<p>PT power transmission</p>	<p>1. AUT PT: Gear Box (Take apart and reassemble a gear box in practice, diagnosis of malfunction, answer theoretical questions) 2. 40 minutes 3. practical task 4. diagnosis / trouble shooting 5. mechanical/hydraulic 6. a) 2,78 b) 2,67 c) 3,7 d) 3,0</p>
<p>CSS comfort and security systems (e.g AC, lightning, locking systems, airbags, ...)</p>	<p>1. AUT CSS: Electric wiring diagram (Explain and add functions to a given electric wiring diagram) 2. n.a. 3. theoretical task 4. neither – nor: just knowledge test! 5. electronical/electrical 6. a) 3,33 b) 3,5 c) 4,1 d) 2,9</p>

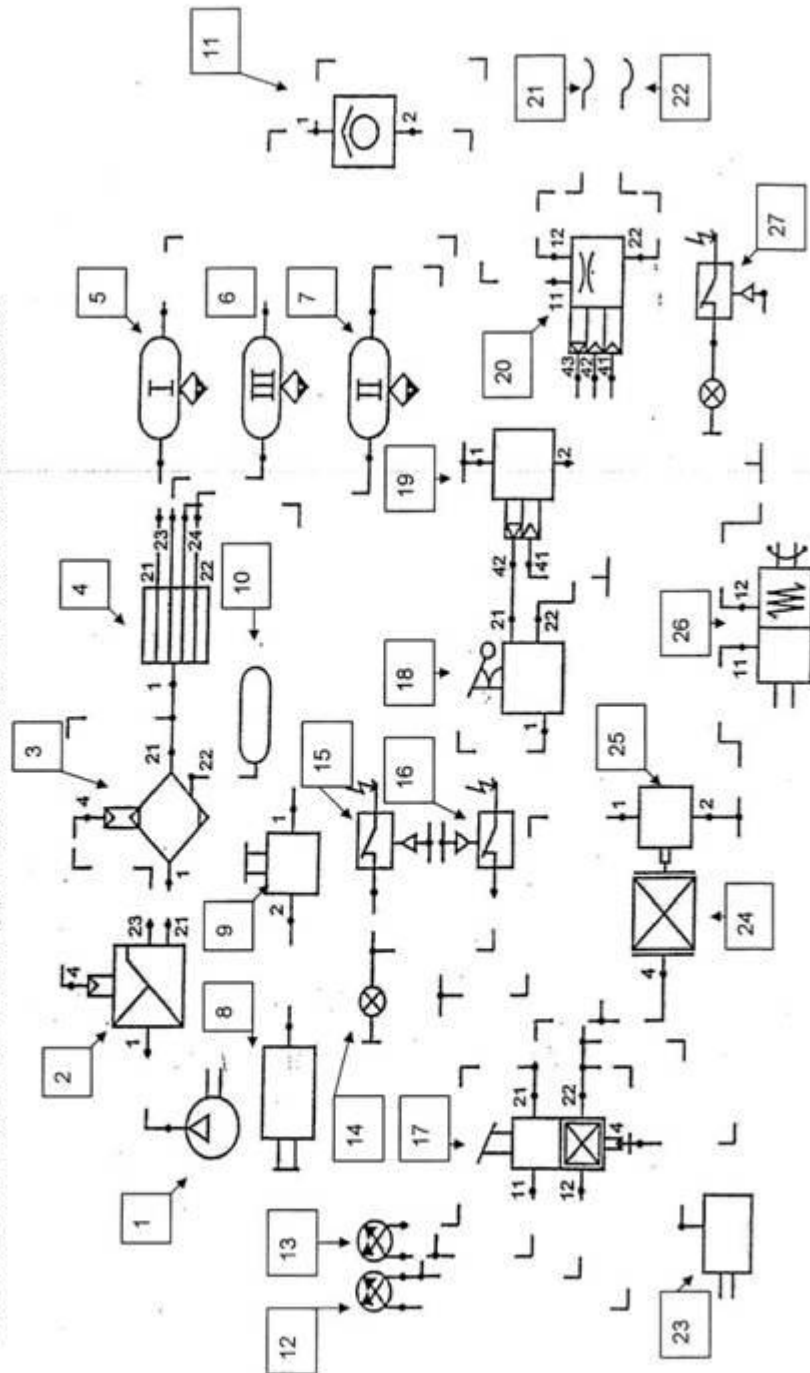
2. AUT BS: Air Break

Station A1

Name:

Nummer:

Druckluftbremse: Ergänzen Sie den Leitungsplan und benennen Sie die Bauteile 1 bis 27 auf der Rückseite



3. AUT UC: Axle MeasurementName: **STATION A4**

Nummer:

Achsvermessung :

Nummerieren Sie die Arbeitsfolge von 1-13

	Arbeitsfolge, Nr.	Max. Punkte	Err. Punkte
Auto auf der Bühne		18	
Auto durchfedern			
Auto von der Bühne, Probefahrt			
Hinterachse anheben und Rundlauf durchführen li. + re.			
Hinterachse vermessen.			
Lenkgetriebe (Lenkrad) gerade stellen			
Reifendruck prüfen.			
Projektoren montieren.			
Radaufhängung überprüfen.			
Spur einstellen.			
Sturz einstellen.			
Vorderachse anheben und Rundlauf durchführen li. + re.			
Vorderachse vermessen.			

Achsvermessung am Modell nach Angabe:

Vorderachse	Sollwert	Istwert	Fehler	OK
Spur				
Sturz				
Nachlauf				

Erklären Sie folgende Begriffe

Vorspur:	7	
Nachspur.		
Sturz.		
Spreizung.		
Nachlauf.		
Spurdifferenzwinkel.		
Lenkrollhalbmesser.	25	
Gesamtpunkte		

4. AUT PT: Gear Box

Name: STATION B 2 Nummer:

Getriebe 1: Schaltgetriebe teilweise zerlegen und zusammenbauen, Fehlerprotokoll erstellen, Arbeitsblatt ausfüllen !!!

1. Wie bezeichnet man das dargestellte Wechselgetriebe bezüglich der Lage von An- und Abtrieb und Gangzahl?

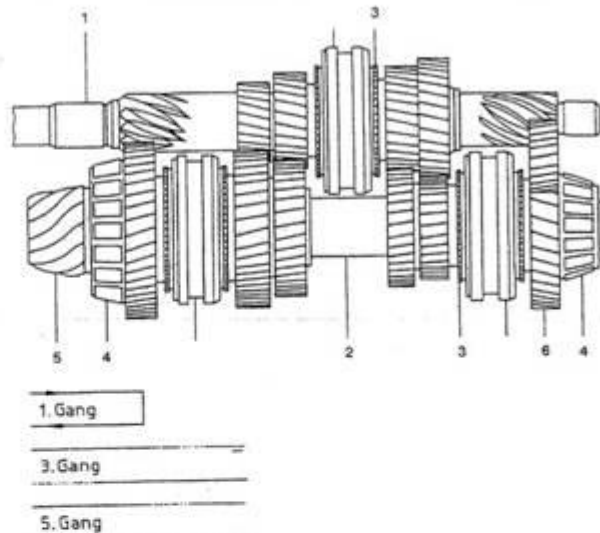
2. Tragen Sie die Benennungen und die fehlenden Positionsnummern ein.

- 1
- 2
- 3
- 4
- 5
- 6

S₁ Schaltmuffe 1/2. Gang

S₂ Schaltmuffe 3/4. Gang

S₃ Schaltmuffe 5/R-Gang



1. Gang

3. Gang

5. Gang

3. Zeichnen Sie den Kraftfluß für den 3. und 5. Gang ein.

4. Über welche Teile der Synchronisiereinrichtung erfolgt der Kraftfluß bei geschaltetem Gang?
Gangrad,

5. Ergänzen Sie die Tabelle.

Gang	1. Gang	2. Gang	3. Gang	4. Gang	5. Gang	Rückwärtsgang
Schaltmuffe						
wird verschoben nach						

6. Woran kann man im Bild erkennen, daß der 5. Gang ins Schnelle übersetzt?

7. Die Zahnräder des 5. Ganges haben 30 und 38 Zähne.

a) Berechnen Sie die Übersetzung des 5. Ganges

b) Welche Vorteile gegenüber dem 4. Gang bietet diese Übersetzung bei gleicher Fahrgeschwindigkeit?

Maximale Punktzahl	20	Erreichte Punkte	
Praktisches Wissen	5		
		Gesamtpunktzahl	

5. AUT CSS: Electric wiring diagram



KRAFTFAHRZEUGTECHNIK

Fachzeichnen

2. Elektrischer Schaltplan

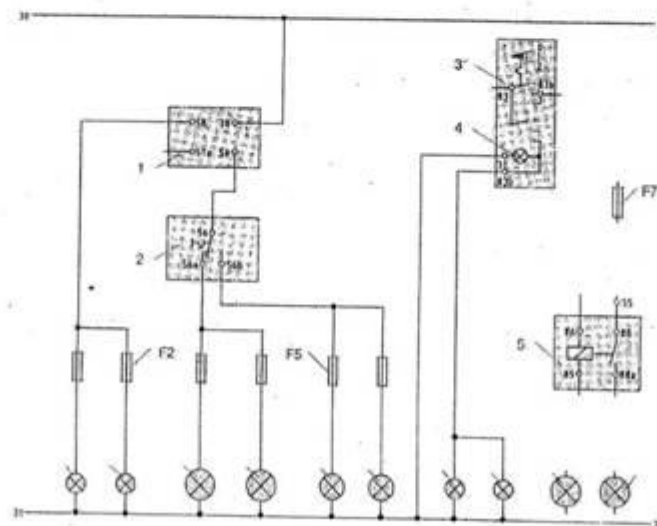
1. Tragen Sie die Kennzeichen der vorgegebenen Geräte in den Stromlaufplan ein.

- | | |
|--|---|
| E3 Scheinwerfer für Fernlicht links | E4 Scheinwerfer für Fernlicht rechts |
| E5 Scheinwerfer für Abblendlicht links | E6 Scheinwerfer für Abblendlicht rechts |
| E7 Nebelscheinwerfer links | E8 Nebelscheinwerfer rechts |
| E1 Begrenzungsleuchte links | E2 Begrenzungsleuchte rechts |
| E9 Nebelschlußleuchte links | E10 Nebelschlußleuchte rechts |

2. Benennen Sie die im Stromlaufplan mit Zahlen gekennzeichneten Geräte, und ordnen Sie den aufgeführten Sicherungen die entsprechenden Kennzeichen zu.

- | | |
|---------|--|
| 1 _____ | 5 _____ |
| 2 _____ | Sicherung für die Begrenzungsleuchte rechts |
| 3 _____ | Sicherung für den Abblendlichtscheinwerfer links |
| 4 _____ | Sicherung für die Nebelscheinwerfer |

3. Ergänzen Sie den Stromlaufplan für einen Nebelscheinwerferanbau.
Die Nebelscheinwerfer sollen bei eingeschalteten Begrenzungsleuchten einschaltbar sein und beim Einschalten des Fernlichtes selbsttätig ausgeschaltet werden.

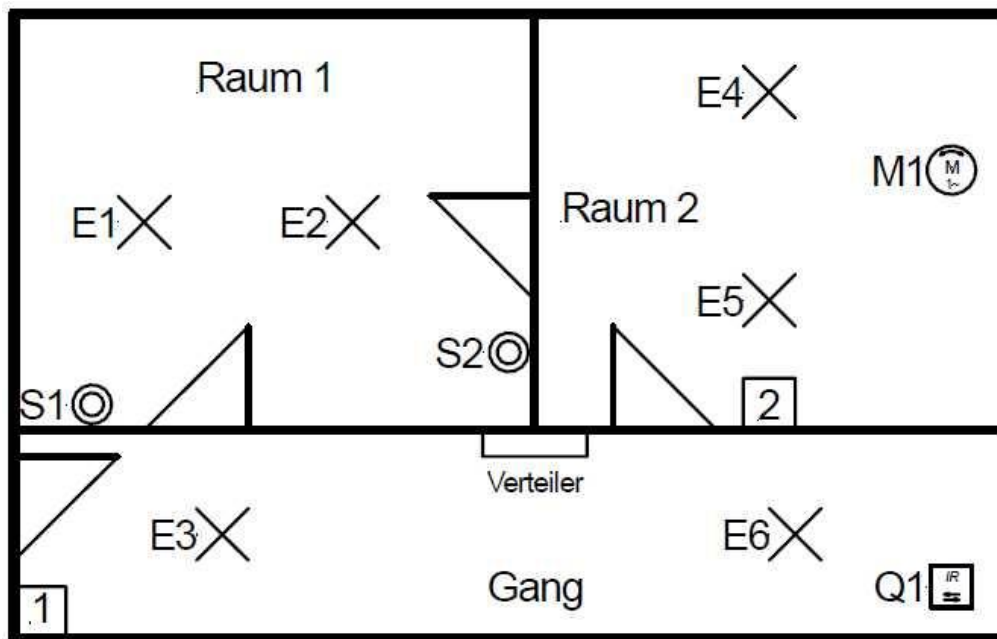


Datum: Name:

5.2. Electrician (Craft sector)

Assessment Task 1 & 2: Building Automation (EIB), theory and practice

Installationsplan:



Steuerungsbeschreibung:

Von S1 u. S2 sind die Leuchten E1 und E2 über herkömmliche Taster über den EIBBus ein- und auszuschalten. Die Leuchten E3 und E6 sind über den im Vorraum platzierten Bewegungsmelder (Q1) ein- und auszuschalten. Von Schaltstelle 2 sind die Leuchten E4 und E5 ein- und auszuschalten. Die Leuchte E4 soll verzögert 3 Sekunden einschalten und 10 Sekunden verzögert ausschalten. Von Schaltstelle 4 soll auch die Jalousie gesteuert werden. Von Schaltstelle 1 sind alle Leuchten im Gebäude zentral auszuschalten. Die Spannungsversorgung (+Drossel), das Schnittstellenmodul (USB bzw. RS232), die Aktoren und die Binäreingänge werden in den Gang- Verteiler eingebaut.

Aufgabenbeschreibung:

Zeichnen Sie die Schaltzeichen der EIB-Taster mit ihren physikalischen Adressen in den Grundrissplan ein. Zeichnen Sie den Verdrahtungsplan der EIB-Teilnehmer (Aktoren, Binäreingänge), die im Verteiler eingebaut sind. Ordnen Sie auch diesen Modulen eine physikalische Adresse zu. Bauen Sie die Schaltung für Schaltstelle 2 auf, parametrieren Sie die Bauteile und nehmen Sie die Schaltung in Betrieb.

Assessment Task 3: Intercom system including door opener

Lehrabschlussprüfung Elektroinstallationstechniker

Elektrische Prüfarbeit Installationslabor

Name: _____

Prüfungs- Nr.: _____

Prüfungstafel 2/1

3) GEGENSPRECHANLAGE

Arbeitsauftrag:

Verdrahten Sie die Schaltung nach dem vorgegebenen Schaltplan. Die Verbindungen sind in den Abzweigdosen an den Klemmen herzustellen.

Die Anschlüsse in den Bauteilen sind fix verbunden und dürfen nicht verändert werden.

Bewertungskriterium		maximale Punkte	erreichte Punkte
Sprechfunktion	Wohnung 1	2	
	Wohnung 2	2	
Türöffnerfunktion	Wohnung 1	1	
	Wohnung 2	1	
Klingelfunktion von Türsprechstelle		1	
Klingelfunktion von Etagentaste		1	
Tableaubeleuchtung		1	
Werkzeugverwendung		1	
Gesamt		10	

Assessment Task 4: Electrical circuits and switching

Lehrabschlussprüfung Elektroinstallationstechniker

Elektrische Prüfarbeit Installationslabor

Name: _____

Prüfungs- Nr.: _____

Prüfungstafel 2/2

4) I N S T A L L A T I O N S S C H A L T U N G

Bewertungskriterium		maximale Punkte	erreichte Punkte
Kreuzschaltung	Funktion	3	
	Vorgangsweise bei der Funktionsprüfung	1	
Treppenhausschaltung	Funktion	3	
	Erklärung ¾ Leiterschaltung	2	
Bewegungs- o. Dämmerungsschalter	Funktion	4	
	Einstellung	1	
Steckdose	Funktion	2	
	Prüfen Schutzmaßnahme Berührspg.	2	
	Auslösung	1	
Werkzeugverwendung		1	
Gesamt		20	

Assessment Task 5: Lighting engineering

5.1) Nenne den Unterschied zwischen ... Beleuchtung!

a) Direkter

b) Indirekter

a) Direkte Beleuchtung: Gesamter Lichtstrom direkt in den Raum.

b) Indirekte Beleuchtung: Gesamter Lichtstrom an die Decke, von dort in den Raum reflektiert.

5.2 Auf welche Weise kann die Helligkeit einer Leuchtstofflampe gesteuert werden?

Phasenanschnittsteuerung (Dimmer - Leuchtstofflampe mit Zündstreifen, ohmsche Grundlast). Mittels elektronischem Vorschaltgerät (EVG), keine besonderen Maßnahmen.

5.3) Was versteht man unter Lichtausbeute und wie wird sie angegeben?

Verhältnis des abgegebenen Lichtstromes zur zugeführten elektrischen Leistung Lm/W .

5.4) Warum ist die Lichtausbeute bei einer Leuchtstofflampe größer als bei der Glühlampe?

- Weniger Wärmeverluste
- Höhere Lichtausbeute durch Umwandlung der UV-Strahlung in sichtbares Licht

5.5) Welche Aufgabe hat der Leuchtstoffbelag bei einer Leuchtstofflampe?

Umwandlung von UV-Strahlung in sichtbares Licht.

5.6) Was ist bei der Installation von Niedervolt-Halogenbeleuchtungsanlagen besonders zu beachten?

- Leitungsquerschnitt (großer Strom)
- Temperaturabfuhr (bei den Lampen und beim Trafo)

- Trafoplatzierung möglichst nahe an den Lampen
- Leitungslänge

5.7) Nenne die Vor- und Nachteile eines elektronischen Vorschaltgerätes!

Vorteile:

- Zündet sofort und ohne Flackern
- Kein Brummen
- Hohe Wirtschaftlichkeit
- Kein stroboskopischer Effekt
- Große Lebensdauer

Nachteil:

- Preis

5.8) In welchem Zusammenhang stehen Beleuchtungsstärke und Entfernung der Lichtquelle?

Die Beleuchtungsstärke nimmt im Quadrat der Entfernung ab.

5.9) Von welchen Faktoren ist der Beleuchtungswirkungsgrad abhängig?

- Bauart und Anordnung der Leuchte
- Farbe und Reflexion von Decke und Wänden
- Abmessungen des Raumes

5.10) Welche Vorteile haben Leuchtstofflampen gegenüber Glühlampen?

- Etwa 8-fache Lebensdauer (abhängig von der Schalzhäufigkeit)
- Ca. 4-fache Lichtausbeute
- Geringere Leuchtdichte (blendfreier)

Assessment Task 6: Heating control**Prüfungstafel 2/3****6) HEIZUNGSSTEUERUNG**

Die Heizungspumpe soll über den Fehlerstromschutzschalter, Leitungsschutzschalter, Schütz und Thermorelais in Betrieb gesetzt werden. Der Haupt- und Steuerstromkreis werden über den Fehlerstromschutzschalter Q1 geführt. Der Kurzschluss- und Leitungsschutz für den Fehlerstromschutzschalter erfolgt über den Leitungsschutzschalter F1. Die Heizungspumpe M1 soll über das Schütz K2 und das Thermorelais F2 geschaltet werden. Für den Schutz des Steuerstromkreises steht der Leitungsschutzschalter F3 zur Verfügung.

Die Steuerung erfolgt über eine Schaltuhr H1 und zwei Thermostate. Die Umschaltung von Normaltemperatur erfasst durch das Thermostat S1 (Temperatur 22°C) und abgesenkter Temperatur Thermostat S2 (Temperatur 17°C) erfolgt über die Schaltuhr.

Die Schaltung soll folgend programmiert werden:

Thermostat 1 ein:	06h00	Thermostat	08h00
	11h00		13h30
	16h00		22h30

Alle Leitungen sind über die Klemmleisten zu führen.

Arbeitsauftrag:

Zeichnen Sie nach obiger Funktionsbeschreibung einen Stromlaufplan (Schalt-Skizze) unter Verwendung normgerechter Schaltzeichen. Stellen Sie alle Geräte auf die angegebenen Daten ein.

Verdrahten Sie die Schaltung mit:

Hauptstromkreis	H07V F 1,5 sw
Steuerstromkreis	H07V F 1,5 br
N und PE	entsprechend

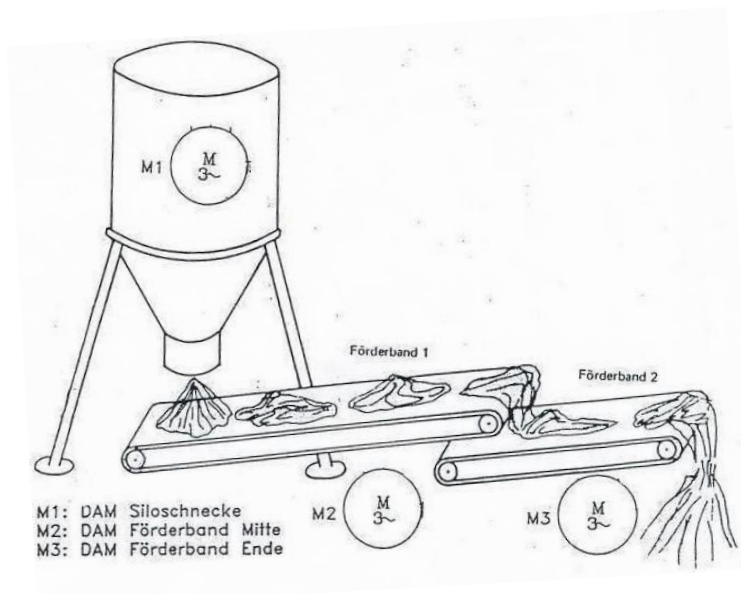
Bewertungskriterium		maximale Punkte	erreichte Punkte
Schaltskizze	funktionelle Richtigkeit	4	
	normgerechte Darstellung	4	
Verdrahtung	Hauptstromkreis	4	
	Steuerstromkreis	4	
Sauberkeit	je Anschlüsse 2 Drähte, Aderendhülsen	2	
Verdrahtungsfarben	Hauptstr. sw, Steuerstr. br, N, bl	1	
Werkzeugverwendung		1	
Gesamt		20	

Assessment Task : Loading unit for trucks

Der Inhalt eines Silos wird über zwei hintereinanderliegende Förderbänder auf LKW verladen. Damit dem Silo Material entnommen werden kann, muss die Pumpe

des Silos laufen. Sowohl die Pumpe als auch die beiden Förderbänder werden durch Drehstromkurzschlussläufermotoren angetrieben. Die Motoren sind mittels

Thermorelais gegen Überlastung geschützt.



Für die Steuerung des Ablaufs gelten folgende Bedingungen:

- Zuerst sind die beiden Förderbänder mit zeitlicher Versetzung nach der Reihe so einzuschalten, dass zunächst eventuell noch am Band vorhandenes Material weggefördert wird, erst im Anschluss daran darf die Pumpe in Betrieb gehen.
- Bei Ausfall eines Förderbandes muss die ganze Anlage sofort abgeschaltet werden. Bei der Wiederinbetriebnahme ist zu beachten, dass die Einschaltreihenfolge eingehalten wird.

Durchzuführende Teilaufgaben:

- Entwicklung einer einfachen hardwaremäßigen Steuerung dieser Anlage ohne Berücksichtigung weiterer Bedingungen
- Normgerechte Zeichnung des Steuerstromkreises
- Normgerechte Zeichnung des Hauptstromkreises

Assessment Task 8: Motor feeding line

Von einem Drehstromasynchronmotor sind u. a. folgende Daten bekannt:

$U_N = 400 \text{ V}$, Leistungsaufnahme Δ : 9 kW, $\cos \varphi = 0,82$.

Dieser Motor ist in einer Entfernung von 150 m vom zugehörigen Verteilerschrank aufgestellt.

Teilaufgaben:

- Berechnung des Nennstroms dieses Motors
- Festlegung des Normquerschnitts der Zuleitung hinsichtlich Strombelastbarkeit und Spannungsabfall unter Zuhilfenahme der entsprechenden Normen und Vorschriften
- Auswahl des Leitungsschutzes am Beginn dieser Leitung
- Einstellbedingungen für den Motorschutzschalter (Stromwert)

Assessment Task 9: Inspection of equipment, documentation

Nachstehende Überprüfungen und Messungen sollen an den vorgegebenen Anlagen und Anlagenteilen durchgeführt werden, die dazu nötigen Messgeräte und Messanordnungen sind selbst zu wählen. Die Ergebnisse und Messwerte sollen mit den zulässigen Normdaten verglichen werden und sind entsprechend zu dokumentieren. Zur Dokumentation dient nachstehende Liste oder ein entsprechendes, regional unterschiedliches Anlagenprotokoll.

1) Sichtprüfung

- a. Zählerschrank
- b. Unterverteiler
- c. Aufputzinstallation
- d. Vorzählerleitung
- e. Nullungsbedingung
- f. Haupt- und Potentialausgleichsschiene
- g. Schutzleiter
- h. Erdungsleitung
- i. Schutzkontakte der Steckdosen
- j. Schutzbereiche (Bad,...)

2) Erproben und Funktionsprüfung

- a. Prüfeinrichtung des Fehlerstromschutzschalters
- b. Richtige Auswahl von Leitungsschutzschaltern und Schaltvorrichtungen
- c. Funktion der Schutzeinrichtung (LSS und Motorschutz)

3) Messungen

- a. Messung des Anlagenerders
- b. Messung des Schleifenwiderstandes
- c. Messung des Isolationswiderstandes
- d. Feststellung des Drehfeldes
- e. Prüfung des Fehlerstromschutzschalters
 - Auslösezeit
 - Abschaltstrom

Geprüfte Anlage :

.....

.....

.....

DOKUMENTATION

1.) Sichtprüfung

Kommentar

- a.
- b.
- c.
- d.
- e.
- f.
- g.
- h.
- i.
- j.

2.) Erprobung und Funktionsprüfung

Kommentar

- a)
- b)
- c)

3.) Messungen

Gemessener Wert

zulässig laut Normung- Kommentar

- | | |
|------------|-------|
| a. | |
| b. | |
| c. | |
| d. | |
| e. -)..... | |
| -)..... | |

Ort, Datum.....
.....

Name:

Assessment Task 10: Technology of measurement

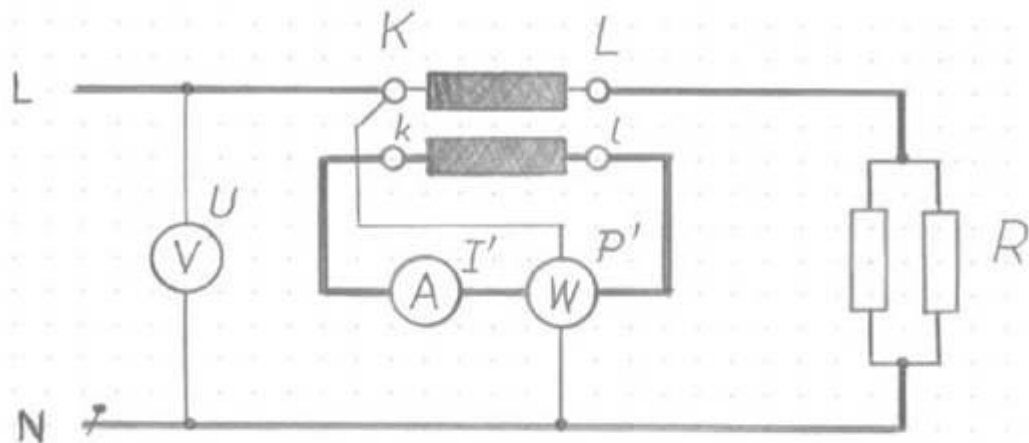
Zwei Elektrowärmegeräte sind parallel zu schalten. Messen sie deren Gesamtwiderstand.

a) Errechnen Sie unter der Annahme einer Netzspannung von $U_{LN} = 230 \text{ V}$ die zu erwartende Stromaufnahme und Leistungsaufnahme.

b) Entwerfen Sie eine Messschaltung zur Überprüfung der errechneten Werte.

c) Bauen Sie die entworfene Messschaltung auf.

d) Tragen Sie die errechneten und gemessenen Werte in eine Messtabelle ein und vergleichen sie.



$$\ddot{u}_I = \frac{I_{(K-L)}}{I'_{(k-l)}} \quad \text{ratio of current transformer}$$

$$\bar{I} = I' \cdot \ddot{u}_I \quad P = P' \cdot \ddot{u}_I \quad I', P' \dots \text{readings on ammeter \& wattmeter}$$

5.3. Business and Administration

Beispiel 1) Kalkulation

a)

Der Einstandspreis für den LCD-Projektor beträgt EUR 569,00. Wie hoch ist der Bruttoverkaufspreis (inkl. 20 % USt) wenn 26 % Regien, 4,5 % Gewinn, 2 % Skonto und 5 % Kundenrabatt einberechnet werden? Kreuzen Sie die richtige Lösung an. (Das Ergebnis ist auf ganze Euro zu runden.)

- ☐ EUR 963,00 Platz für etwaige Nebenrechnungen:
- ☐ EUR 966,00
- ☐ EUR 1.003,00

b)

Eine externe Mini-Festplatte hat einen Bezugspreis von EUR 77,90 (exkl. USt). Aufgrund der allgemeinen Marktlage kann die Mini-Festplatte um höchstens EUR 130,80 (inkl. 20 % USt) abgesetzt werden. Bei der Preisberechnung sind 30 % Gemeinkostenzuschlag sowie 3 % Kundenskonto zu berücksichtigen. Wie hoch ist der erzielbare Gewinn in Euro und in Prozent (auf eine Dezimalstelle genau)? Kreuzen Sie jeweils die richtige Lösung an.

- | | |
|-----------------------------------|--------------------------------|
| <input type="checkbox"/> EUR 4,46 | <input type="checkbox"/> 4,4 % |
| <input type="checkbox"/> EUR 5,51 | <input type="checkbox"/> 5,4 % |
| <input type="checkbox"/> EUR 5,62 | <input type="checkbox"/> 5,8 % |

Platz für etwaige Nebenrechnungen

Beispiel 2) Wirtschaftssysteme

Kreuzen Sie an: Welche der folgenden Aussagen sind richtig bzw. falsch?

	richtig	falsch
Das Wirtschaftswachstum eines Landes wird anhand der Veränderung des Bruttoinlandsproduktes (BIP) gemessen.		
Das BIP gibt Auskunft über die Qualität des Wirtschaftswachstums.		
Den größten Betrag zum Bruttoinlandsprodukt liefert der primäre Wirtschaftssektor, obwohl der tertiäre Wirtschaftssektor die meisten Beschäftigten aufweist.		
Mit dem Bruttoinlandsprodukt können die Leistungen verschiedener Volkswirtschaften miteinander verglichen werden.		

Beispiel 3) Rechtsformen

Kreuzen Sie an: Welche der folgenden Aussagen sind richtig bzw. falsch?

	richtig	falsch
„Dr. Bernd Müller wurde zum Aufsichtsratsvorsitzenden der Bernd Müller OG gewählt.“		
In einer Kommanditgesellschaft ist jeder Gesellschafter zur Mitarbeit berechtigt und verpflichtet.		
Die Prokura umfasst mehr Kompetenzen als die Handlungsvollmacht.		
Obwohl der Einzelunternehmer auch mit seinem Privatvermögen haftet, sind die meisten Unternehmen in Österreich Einzelunternehmer.		
Die Aktiengesellschaften unterliegen der Einkommensteuer.		
Die GmbH ist eine Kapitalgesellschaft, deren Mindestkapital EUR 35.0000,00 beträgt.		

Beispiel 4) Lagerbestände

Prüfen Sie die Lagerbestände und bestellen Sie gegebenenfalls Waren nach. Bei allfälligen Vorteilen (Konditionen, Preise) ist die Bestellmenge geringstmöglichst zu erhöhen. Verwenden Sie dazu beigefügtes Bestellformular.

Auszug aus der Lagerliste:

Lieferantennummer: 33017					
Kundennummer: 20084					
Lieferant: Haberz GesmbH					
Industriestraße 1, 2432 Schwadorf					
Sachbearbeiter: Herr Manfred Siess, Tel.: (02230) 711 13 Fax: DW -30,					
E-Mail: siess@haberz.at					
Lieferbedingungen: 14 Tage nach Bestellung; Lieferung frei Haus.					
Zahlungsbedingungen: 8 Tage 3 % Skonto, 30 Tage netto Kassa					
Sonderkondition: 10 % Sonderrabatt ab einem Nettoeinkaufswert von EUR 500,00					
Artikel- Nummer	Artikel- Bezeichnung	Richt- bestand Stk	Lagerbestand Istbestand Stk	Mindest- beste Im. Stk je VP-Einheit	Preis/Stk EUR exkl. USt
NZB 4100	Kaltlichtspiegellampe Standard 20W, 50mm, 10°	300	245	20	1,43
NZB 4250	Kaltlichtspiegellampe Standard 50W, 50mm, 36°	200	225	20	1,43
NZB 4280	Decostar 51 Titan 35W, 51mm, 38°	150	118	20	3,36
NZB 4300	Niedervoltstiftsockellampe 20W, L44mm, GY6,35	250	260	30	1,10
NZB 4320	Dulux EL Longlife E27 15W, L: 128mm	200	227	20	12,44
NZB 4340	SDW Natriumdampflampe 50W, warmweiß	50	46	5	53,38

Fortsetzung Beispiel 4) Lagerbestände

Haberz GesmbH
 Industriestraße 1
 2432 Schwadorf
 Tel.: (+43 2230) 711 13 Fax: DW -30
 E-Mail: office@haberz.at
 HP: www.haberz.at

Bestellformular

Fax: (02230) 711 13-30

Kundennummer: _____

Kunde: _____

Lieferadresse: _____

Lieferung am: _____

Lieferbedingung: _____

Besteller (Name): _____

Besteller (Telefon): _____

Bestellung

Stück	Artikelnummer	Stück	Artikelnummer
	NZB 4002		NZB 4280
	NZB 4020		NZB 4290
	NZB 4100		NZB 4300
	NZB 4110		NZB 4310
	NZB 4120		NZB 4320
	NZB 4130		NZB 4330
	NZB 4140		NZB 4340
	NZB 4150		NZB 4350
	NZB 4160		NZB 4360
	NZB 4170		NZB 4370
	NZB 4180		NZB 4371
	NZB 4190		NZB 4372
	NZB 4200		NZB 4373
	NZB 4210		NZB 4375
	NZB 4220		NZB 4376
	NZB 4230		NZB 4377
	NZB 4240		NZB 4378
	NZB 4250		NZB 4379
	NZB 4260		NZB 4380
	NZB 4270		NZB 4400

Datum: _____

Unterschrift Besteller: _____

Beispiel 5 und 6 Vorbemerkungen

Sie sind in der Buchhaltung der Riedel-Consulting GmbH in 3430 Tulln beschäftigt. Auf Ihrem Arbeitsplatz finden Sie verschiedene Unterlagen und folgende Nachricht Ihrer Geschäftsführerin Frau Baumgartner vor:

„Bitte folgende Belege lt. Kontenplan auf dem dafür vorgesehenen Buchungsstempel kontieren.“

Gruß Brigitte Baumgartner“

Kontenplan (Auszug)**Klasse 0**

0600 Büroeinrichtung

Klasse 1

1700 Sonstige Vorräte

Klasse 2

2000 Lieferforderungen
2500 Vorsteuer
2501 Vorsteuer aus innergem. Erwerben
2700 Kassa
2800 Bank
2790 Ford. Kreditkarten
2794 Ford. Bankomatkarten

Klasse 3

3300 Lieferverbindlichkeiten
3500 Umsatzsteuer
3501 Erwerbsteuer
3520 USt-Zahllast
3540 Verbindlichkeiten Finanzamt
3620 Verbindlichkeiten gegen Mitarbeiter
3660 Verbindlichkeiten Gemeinde
3680 Verbindlichkeiten GKK

Klasse 4

4000 Erlöse 20%
4400 Erlösberichtigung 20 %
4600 Erlöse aus Anlagenverkauf
4890 Mahnspesenvergütung
4900 Eigenverbrauch

Klasse 5

5010 Handelswareneinsatz
5340 Verpackungsmaterial
5630 Stromverbrauch
5880 Lieferantenskonti auf Wareneinkauf

Klasse 6

6200 Gehälter
6410 Betriebl. Mitarbeitervorsorge
6560 Gesetzl. Sozialaufwand Ang.
6660 Dienstgeberbeitrag Ang.
6670 Zuschlag zu DB Angestellte
6680 Kommunalsteuer Angestellte
6690 Wr. Dienstgeberabgabe Ang.
6700 Freiwilliger Sozialaufwand

Klasse 7

7010 Anlagenabschreibung (AfA)
7030 Abschreibung geringwertiger Wirtschaftsgüter
7100 Grundsteuer
7200 Instandhaltung durch Dritte
7220 Reinigung
7320 Pkw-Betriebsaufwand
7325 Versicherungsaufwand Pkw
7330 Lkw- Betriebsaufwand
7380 Portoaufwand
7381 Ausgangsfrachten
7382 Telefon- u. Internetgebühren
7400 Mietaufwand
7600 Büromaterial
7630 Fachliteratur und Zeitungen
7640 Blumen und Dekorationsaufwand
7700 Versicherungsaufwand
7755 Steuerberatungsaufwand
7820 Buchw. abgegang. Anlagen

Klasse 8

8090 Verzugszinsenerträge
8100 Zinserträge
8300 Zinsaufwand

Klasse 9

9600 Privat
9610 Privatsteuern

Beispiel 5) Belegkontierung (ER, Kassa)

Bürodiskont GesmbH Sandleitengasse 45 1160 Wien Tel.: (01) 486 10 29-0 Fax: (01) 486 10 29-10 E-Mail: office@buerodiskont.at Internet: www.buerodiskont.at Riedel-Consulting GmbH Karl-Metz-Gasse 26 3430 Tulln	ER 612 <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="3">GEBUCHT:</th></tr> <tr> <th>Konto</th><th>SoH</th><th>Haben</th></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	GEBUCHT:			Konto	SoH	Haben									
GEBUCHT:																
Konto	SoH	Haben														

Rechnung Nr.: 7618/07	Rechnungsdatum: 2007-07-19 Versanddatum: 2007-07-19 Versandart: DPD Frachtkosten: EUR 0,00 Fälligkeitsdatum: 2007-08-19
------------------------------	---

Art. Nr.	Bezeichnung	Pack	VPEH	Preis/Packung EUR	Gesamt EUR
GA1-356	Fadenverstärkte Versandtaschen	3	100 St.	45,99	137,97
GA1-M14	Luftpolster Versandtaschen	5	50 St.	17,99	89,95
Netto-Warenwert					227,92
+ 20 % USt					45,58
Rechnungsbetrag					273,50

Wir danken für Ihren Einkauf!

Bankverbindung: Wien Bank, BLZ 32255, Kontonummer 00 110 725 954, UID: ATU 08977857, Gerichtsstand: Wien
FN 346287d, Firmenbuch HG Wien

Kassabeleg Nr.: K 642

KASSAEINGANG

Netto	€	
20 % USt	€	
Kassa empfängt:	€ 201,60	

in Worten: EURO zweihunderteinssechzig

von: Hauer GesnBR, 1030 Wien

für: AR 352/07

<u>Tulln</u>	<u>2007-07-19</u>	<u>Hannes Krombach</u>
Ort	Datum	Unterschrift

GEBUCHT:		
Konto	SoH	Haben

Beispiel 6) Belegkontierung (Buch, Benzin)

K 643

Wirtschaftsuniversität Wien
WIRTSCHAFTS UNIVERSITÄT WIEN
WIRTSCHAFTS UNIVERSITÄT WIEN

WU-Shop
Augasse 2 – 9, 1090 Wien
UID-Nr. 34598708
Barverkauf Nr. 988120242

Anz	Datum: 19. Juli 2007	Preis/Stk EUR	EUR gesamt
1	CRS –Corporate Social Responsibility, Fachliteratur	64,90	64,90
	Total inkl. 10 % USt		64,90

Betrag dankend erhalten!

GEBUCHT:

Konto	Soll	Haben

Riedel Consulting GmbH **K 644**

Karl-Metz-Gasse 26

3430 Tulln

Rechnung Nr. 234560986

	L/Stk	USt	Betrag (inkl USt)
Super Plus bleifrei 98 ROZ		20 %	
Super bleifrei 95 ROZ		20 %	
Benzin bleifrei 91 ROZ		20 %	55,00
Diesel Plus		20 %	
BP Ultimate Diesel		20 %	

Betrag inkl. USt dankend erhalten **55,00**

Nur bei Beträgen im Wert von über EUR 150,00
Rechnungsnummer:
Quittungsdatum = Rechnungsdatum

Vielen Dank und auf Wiedersehen!

19. Juli 2007 SB Tankstelle
2320 Schwechat
R. Hofmann

Datum Stempel/Unterschrift

Treibstoff PKW

GEBUCHT:

Konto	Soll	Haben

Beispiel 7) Angebotsvergleich

Frau Baumgartner ersucht sie weiters folgende Angebote für den Ankauf von Leuchtkästen für die Riedel-Consulting GmbH zu vergleichen. Bestellen Sie danach 6 Stück vom günstigsten Anbieter per Email. Schicken Sie die Bestellung in cc auch an Frau Baumgartner.

Der Skonto wird bei der Zahlung in Anspruch genommen und soll bei der Kalkulation berücksichtigt werden.

TOP TECH DUPKA & PARTNER KG Kremser Straße 24 3100 St. Pölten Tel: (02742) 811 10-0 Fax -11 E-Mail: office@toptech.at Internet: www.toptech.at	
Riedel-Consulting GmbH zH Frau Mag. Baumgartner Karl-Metz-Gasse 26 3430 Tulln	
	Datum: 2007-07-12 Zeichen: Gr Bearb.: Fr. Gratzner Tel.-DW: 16
Angebot Nr. 2642/2007	
Sehr geehrte Frau Mag. Baumgartner!	
Vielen Dank für Ihre Anfrage. Gerne unterbreiten wir Ihnen folgendes Angebot (gültig bis 31. Oktober 2007):	
Aluminium-Leuchtkasten für den AUSSENEINSATZ - CITYPOSTER Best. Nr.: AAK6815, Preis/Stück exkl. 20 % USt: EUR 718,00	
Maße (HxBxT in mm): 1245x1805x115; Lampen: 1 x 32 Watt Aluminium-Korpus, Bautiefe 80 mm (einseitig) oder 100 mm (doppelseitig) Frontseitiger Aluminium-Klapprahmen, 25 mm Ultrasoft Profil (bei Cityposter 45 mm Softline Profil), silber eloxiert	
Ab einer Abnahmemenge von 3 Stück gewähren wir Ihnen einen Rabatt von 5 %. Ab einer Abnahmemenge von 5 Stück beträgt der Rabatt 10 %.	
Die Lieferung erfolgt innerhalb von 1 KW ab Auftragseingang frei Haus. Zahlungsbedingungen: 10 Tage 2 % Skonto, 30 Tage netto Kassa	
Wir hoffen, dass unser Angebot Sie zufrieden stellt und freuen uns auf Ihren Auftrag.	
Mit freundlichen Grüßen	
TOP TECH DUPKA & PARTNER KG	
Sandra Gratzner	
Sandra Gratzner Verkauf Wien, E-Mail: gratzer@toptech.at	
Beilage 1 Produktbeschreibung	

Fortsetzung Beispiel 7) Angebotsvergleich

<p style="text-align: center;"> WERBECENTER Franz Klinger KG Wiener Straße 24 7000 Eisenstadt Tel: (02682) 14 30 20-0 Fax: -13 E-Mail: office@klinger.at Internet: www.klinger.at </p>	
<p> Riedel-Consulting GmbH zH Frau Mag. Baumgartner Karl-Metz-Gasse 26 3430 Tulln </p>	<p> Datum: 2007-07-14 Zeichen: FK/Kr Bearb.: Hr. Krauhs Tel.-DW: 24 </p>
<p>Angebot Nr. 07-854</p>	
<p>Sehr geehrte Frau Mag. Baumgartner!</p>	
<p>Wir freuen uns über Ihr Interesse an unseren Leuchtkästen und unterbreiten Ihnen gerne folgendes Angebot (gültig bis 31. Oktober 2007):</p>	
<p> Artikelnummer: 18735 Artikel: LEUCHTKASTEN - CITYTOP / AUSSEN - 1200 x 1760 mm (Details – siehe Prospekt) </p>	
<p>Preis/Stück: EUR 685,00 (exkl. USt)</p>	
<p>Sonderkondition: 5 % Rabatt ab einer Abnahmemenge von 3 Stück</p>	
<p> Lieferbedingungen: Lieferung innerhalb von 10 Werktagen ab Auftragseingang. Für die Lieferung verrechnen wir eine Zustellpauschale von EUR 30,00. </p>	
<p>Zahlung: 10 Tage 3 % Skonto, 30 Tage netto Kassa.</p>	
<p>Mit freundlichen Grüßen</p>	
<p>FRANZ KLINGER KG</p>	
<p><i>Günther Krauhs</i></p>	
<p>Günther Krauhs Verkaufsleiter</p>	
<p>1 Prospekt „CITYTOP - Leuchtkästen“</p>	

Unbenannt - Nachricht (HTML)

Nachricht Einfügen Optionen Text formatieren

Einfügen Zwischenablage Basistext Adressbuch Namen überprüfen Namen Einschließen Nachverfolgung Optionen Rechtschreibung Dokumentprüfung

An... Cc... Betreff:

Senden

Beispiel 8) Rechnungserstellung

Sie arbeiten im Büro der Firma „Lichtblick Thomas Gartner OG“ in Mödling. Von Ihrer Vorgesetzten Daniela Roth erhalten Sie folgende Nachricht:

Bitte um Erledigung

Die Lieferung an die Firma Gesig Sicherheitstechnik GmbH wir heute mit DHL versandt:

*5 Stück Sunset Bodeneinbaustrahler-Matt
6 Stück Wandlampe Noctus
2 Stück Gartenlampe Noctus 60 cm*

Ich habe mit der Firma Gesig für diesen Auftrag einen Sonderrabatt von 15 % auf die Bodeneinbaustrahler vereinbart.

Bitte Rechnung erstellen, Überweisungsformular ausfüllen und mitgeben.

Roth, 28. Juni 2007

Auszug aus Ihrer Kundendatei:

Kundennummer:	200107
Kunde:	Gesig Sicherheitstechnik GmbH
Kundenanschrift:	Bahngasse 10-12 2700 Wiener Neustadt
UID-Nummer:	ATU 98101304

Auszug aus Ihren AGB:

Firmenkunden erhalten ein Zahlungsziel von 30 Tagen, 2 % Skonto bei Zahlung innerhalb von 8 Tagen.
--

Die letzte Rechnungsnummer lautete: 921/07

Fortsetzung Beispiel 8) Rechnungserstellung**Auszug aus Ihrer Preisliste**

Artikel-nummer	Artikel	Preis/St EUR exkl. 20 % USt	Rabatt	Aktionspreis e gültig bis 31. Juli 2007
NOR40S T	Gartenlampe NORTHPOL Ø 10 x H40 cm; Granit, Edelstahl	315,00	ab 5 Stück 10 %	
NOR40T M	Gartenlampe NORTHPOL Ø 10 x H40 cm; Teak, Messing	235,00		
NOR70T M	Gartenlampe NORTHPOL Ø 10 x H70 cm; Teak, Messing	265,00		
NOC30	Gartenlampe NOCTUS Bodenlampe Edelstahl H30cm	130,00		120,00
NOC60	Gartenlampe NOCTUS Bodenlampe Edelstahl H60cm	160,00		150,00
NOCW	Wandlampe NOCTUS Edelstahl Ø 6 cm x H60cm	135,00	ab 5 Stück 10 %	
SUN425	SUNSET Bodeneinbaustrahler Matt, dimmbar, inkl. Trafo, belastbar max. 800 kg	254,00		
SUN426	SUNSET Bodeneinbaustrahler Klar, dimmbar, inkl. Trafo, belastbar max. 800 kg	254,00		
KOA125	Gartenleuchte KOALA Aluminium gepresst, max. 50W	105,60		95,60

Überweisung

<input checked="" type="checkbox"/> Finanzbank		ÜBERWEISUNG - EURO	
		EUR	Betrag
Kontonummer EmpfängerIn	BLZ Empfängerbank	Empfängerbank	
EmpfängerIn			
<div style="text-align: center; font-size: 2em; font-weight: bold;">E U R O</div> Unterschrift AuftraggeberIn bei Verwendung als Überweisungsauftrag		Verwendungszweck	
Kontonummer AuftraggeberIn	BLZ-Auftragg./Bankverm.		
AuftraggeberIn/EinzahlerIn - Name und Anschrift			

Fortsetzung Beispiel 8) Rechnungserstellung

LICHTBLICK
Thomas Gartner OG
 Enzersdorfer Straße 7
 2340 Mödling
 Tel.-Nr.: (02236) 31 55 00-0, Fax: DW 10
 E-Mail: office@lichtblick.at
 HP: www.lichtblick.at

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Rechnung Nr.**Kundennummer:****UID-Nr. Käufer:****Rechnungsdatum:****Lieferdatum:****Zahlungsbedingung:**

Pos.	Art. Nr., Artikel	Anzahl	Preis/St EUR	Rabatt %	Betrag EUR
Rechnungsbetrag exkl. USt:					
Zuzüglich % USt:					
Rechnungsbetrag inkl. USt:					

Beispiel 9) Marketing

Sie sind im Marketing der „Modern Sports Wear GmbH“ beschäftigt und finden folgende Nachricht der Unternehmensleitung in Ihrem Posteingang.



Modern Sports Wear Ges.m.b.H.
... OF NOTHING

Modern Sports Wear GmbH
Kumpfgasse 21
9020 Klagenfurt
Tel. (0463) 50 19 09

Klagenfurt, 30. Mai 2007

Verteiler: An Abteilung Verkauf/Marketing
Im Hause

Neues Sortimentssegment "Wellnessurlaub"

Wie bereits im Frühling 2007 in der Marketingsitzung besprochen wird nun der Markt für Wellnessurlaube erschlossen.

Es ist eine **Einladung** für unsere **Einführungspräsentation am 15. Juni 2007 im Schloss am Wörthersee** in Velden zu erstellen, in der auch zwei Wellnessurlaube angeboten werden.

Weiters sollen **alle Übungsfirmen der HAK 1 und der HAK Villach** mittels **Serienbrief** zu dieser Produktpräsentation – mit anschließendem Buffet und Gewinnspiel (ein Urlaub wird verlost) - eingeladen werden.

Anzufertigende Schriftstücke:

- Einladung
- Serienbrief
- Entwurf Präsentation

Beispiel 10) Betriebsergebnis

Die Firma Ökoplus erzeugt zwei unterschiedliche Wasserenthärtungsgeräte. Für das Jahr 2006 wurden folgende Werte ermittelt:

Produkt	Magnetosan	Comfort Plus
Absatz 2006 in Stück	21.931	17.496
Stückerlös in EUR	71,20	89,80
Herstellkosten in EUR	40,30	49,90
Sonderkosten des Vertriebs:		
- pro Stück in EUR	0,90	1,40
- Vertreterprovision (vom Erlös)	8 %	10 %

Verw.- u. Vertr.-Gemeinkosten 28,00 % (auf Basis der Herstellkosten der abgesetzten Menge)

a) Ermitteln Sie die Selbstkosten je Stück. Kreuzen Sie die richtige Lösung an.

Magnetosan**Comfort Plus**
☐ EUR 58,180

☐ EUR 70,262

☐ EUR 66,832

☐ EUR 74,252

☐ EUR 55,708

☐ EUR 85,424
Lösungshilfe:

Verwenden Sie für etwaige Nebenrechnungen nachstehende Tabelle:

Selbstkosten je Stück (auf 3 Dezimale)

Produkt	Magnetosan	Comfort Plus
Herstellkosten		
Vw.- u. Vtr.-GK		
Sonderk. Vertrieb pro Stk.		
Vertreterprovision		
= Selbstkosten		

Fortsetzung Beispiel 10) Betriebsergebnis

- b) Ermitteln Sie den Betriebsgewinn/-verlust für jedes Produkt. Kreuzen Sie die richtige Lösung an.

Magnetosan	Comfort Plus
<input type="checkbox"/> EUR 95.794,61	<input type="checkbox"/> EUR 76.562,50
<input type="checkbox"/> EUR 285.541,62	<input type="checkbox"/> EUR 272.027,81
<input type="checkbox"/> EUR 339.755,05	<input type="checkbox"/> EUR 341.836,85

Lösungshilfe:

Verwenden Sie für etwaige Nebenrechnungen nachstehende Tabelle:

Betriebserfolgsrechnung (Betriebsgewinn/-verlust auf 2 Dezimale genau)

Produkt	Magnetosan	Comfort Plus
Periodenabsatz (Stk.)		
Stückerlös		
Selbstkosten/Stück		
Gewinn/Stück		
= Betriebsgewinn/Produkt		

- c) Ermitteln Sie gesamten Betriebsgewinn/-verlust der Firma Ökoplus

- ☐ EUR 172.357,10 Platz für etwaige Nebenrechnungen:
☐ EUR 557.569,43
☐ EUR 681.591,90

Ergänzte Prüfungsaufgaben „Büro-/Industriekaufleute“

Beispiel 11) Kalkulation

Sie sind im Back-Office der Firma Puser Möbelhandel GmbH, 1160 Wien beschäftigt. Auf Ihrem Schreibtisch finden Sie eine Nachricht Ihrer Vorgesetzten Sabrina Gruber sowie folgendes Schriftstück vor:

Bitte um Erledigung

Verkaufspreis inkl. USt für den Hochschrank „Aquachiaro“ berechnen:

☐ *Frachtkosten nach Stück verteilen*

☐ *Kalkulationssätze:*

35 % Regien,

12 % Gewinn,

2 % Kundenskonto,

10 % Kundenrabatt,

Lieferantenskonto wird in der Kalkulation berücksichtigt.

☐ *Verkaufspreis inkl. USt auf die nächsten 10 Cent aufrunden,*

dh. auf die nächsten 10, 20, 30, 40 etc. Cent.

Gruber, 17. Juli 2008

BAD24 GmbH
Waagplatz 17
5020 Salzburg

Robert Puser
 Möbelhandel GmbH
 Rankgasse 8
 1160 Wien

Rechnung Nr. 5112-08 vom 2008-07-02 (Rechnungsdatum = Lieferdatum)

Pos.	Artikelnr. und Artikelbezeichnung	Menge/Einheit	Preis/ Einheit in EUR	Rabatt in %	Betrag in EUR
1	46-32 Aquachiaro Hochschrank 2 x 180 x 32 cm	2 St.	450,00	10	4.860,00
2	46-42 Aquachiaro Wandschrank 9 x 109 x 35 cm	4 St.	306,00	15	1.040,40
3	48-46 Aquachiaro Waschtisch 02 x 52 cm	4 St.	366,00	0	1.464,00
Nettorechnungsbetrag					7.364,40
+ 20 % USt					1.472,88
Bruttorechnungsbetrag					8.837,28

Zahlung: 14 Tage 3 % Skonto, 60 Tage netto

Bankverbindung: Commerzbank, Konto-Nr. 117-914.346, BLZ 88000
 Firmenbuch FN 121322 g, LG Salzburg; UID: ATU 24681357

Der Transport wird von der *Spedition EUROTRANS* durchgeführt.

Auszug aus der Speditionsnota:

Fracht	EUR 230,00
+ 20 % USt	EUR 46,00
	EUR 276,00

Beispiel 12) Mängelrüge

Sie sind im Büro des Handelsbetriebes MIKU GmbH, 3500 Kremsbeschäftigt. Auf Ihrem Schreibtisch finden Sie folgenden Arbeitsauftrag Ihrer Vorgesetzten Margit Limpl sowie folgende Schriftstücke:

Zur Erledigung

Habe Lieferung von Heimtextilien Miehl kontrolliert.

Bitte Sie daher um Folgendes:

- 1. Lieferschein/Rechnung kontrollieren*
- 2. Falls Fehler: Mängel reklamieren – Mail an Firma Miehl schicken*
- 3. Kopie an mich in Cc*

Limpl, 22. Oktober 2008

Von: limpl@miku.at
 An: online@heimtex-miehl.at
 Gesendet: Freitag, 26. September 2008, 11:26
 Betreff: Bestellung

Wir bestellen zu den üblichen Konditionen (2 % Skonto bei Zahlung innerhalb von 10 Tagen, ansonsten 30 Tage netto Kassa) zur Lieferung in KW 43 (20. bis 24. Oktober 2008):

Art. Nr.	Artikel	Menge	St./Pkg.	Preis/St. EUR
34227	Schiebegardine, 75 x 300cm, natur	100 St.	10	5,50
34234	Raffstore, 90 x 155 cm, natur	50 St.	2	17,10
34587	Kissen, 45 x 45 cm, Motiv Engel, rot	150 St.	5	2,80
34654	Kuscheldecke, 220 x 200, rot	50 St.	2	14,40
34683	Servietten, 40 x 40 cm, Motiv Winter, rot	450 St.	6	1,90

Mit freundlichen Grüßen

Margarethe Limpl

Annalena Miehl OG
Heimtextilien
Margaretenstraße 78, 1050 Wien
E-Mail: online@heimtex-miehl.at

MIKU GmbH
Wiener Straße 87
3500 Krems

**Lieferschein/
Rechnung Nr. 789/08**

Ihre Bestellung vom: 2008-09-26
Lieferung frei Haus am: 2008-10-22
Kunden Nr.: 200811
Bearbeitung: Nina Huber

Art.Nr.	Artikelbezeichnung	Stück	Preis/Stück EUR	Preis/Artikel EUR
34227	Schiebegardine, 75 x 300cm, natur	100	5,50	550,00
34234	Raffstore, 90 x 155 cm natur	50	17,30	865,00
34587	Kissen, 45 x 45 cm, Motiv Engel, rot	200	2,80	560,00
34654	Kuscheldecke, 220 x 200cm, rot	50	14,40	720,00
34684	Servietten, 40 x 40 cm, Motiv Engel, natur	450	1,90	855,00
				3.550,00
			+ 20 % USt	710,00
			Rechnungsbetrag	4.260,00

Raum für Vermerke:
Ware mit Vorbehalt übernommen, Limpl 22. Oktober 2008

Vielen Dank für Ihren Auftrag. Die Ware bleibt bis zur vollständigen Bezahlung unser Eigentum.

Bankverbindung: Finanzbank, Konto-Nr. 210.788.134, BLZ 99000;
Firmenbuch HG Wien FN 314287d; UID: ATU 14238226

Zur Aufgabenlösung:

Unbenannt - Nachricht (HTML)

Nachricht Einfügen Optionen Text formatieren

Einfügen Zwischenablage

Basistext

Adressbuch Namen überprüfen Namen Einschließen Optionen Dokumentprüfung

Senden

An...
Cc...
Betreff:

5.3.1. Additional comments of the rating of the international set of assessment task:

(only in German)

Expert A:

Termini verwenden, die unsere Leute verstehen (zB Rechtsformen d.o.o), korrekte Bezeichnung (Ausbilder statt Berufsbilder), Höflichkeitsform im Deutschen groß etc. etc.; Vereinheitlichung bzw. "Neutralisierung" Schüler/Auszubildender etc. etc. besser "Sie sind beschäftigt"...

zu den einzelnen Beispielen:

1.1 Haselnüsse: verstecktes Zielniveau 1, va. bei a, so etwas wie den Ablaufplan kann man mM nach mündlich besser prüfen, weil ich auf die jeweilige betriebliche Situation eingehen kann (aber klar, in anderen Ländern gibt es nur die Schule)

1.2 belegorientierter wäre meiner Meinung nach besser, hört sich sonst nicht gut an "EXW ab Werk des Lieferanten" - konkreter, Leute können es sich besser vorstellen, nur "i-dipferlreiten" für die Übersetzung "Celejtown" is ein bisschen viel. Die Stadt heißt Celje (oder deutsch Cilli - übrigens sehr schön im Sanntal gelegen....)

2.2 Bitte unsere Art der Formulierung erhalten wie bei den anderen Bsp. als Arbeitsanweisung des Vorgesetzten, bitte nicht so "theoretisch"

2.3 hätte ich mir müssen wahrscheinlich noch genauer anschauen, aber allein der lange Einleitungstext, da steigen "unsere" komplett aus, ist halt so ein klassisches Schulbeispiel, für diese Art der Überprüfung meines Erachtens nicht geeignet - obwohl ich die Verbindung mit Excel gut finde, wenn es denn tatsächlich in Excel gemacht wird

3.1 mündliche Prüfung, konkrete Angabe fehlt (schick Ihnen was mit, wie wir es beim Einzelhandel machen) ⇒ siehe extra Dateien

3.2. zu wenig Angabe, konkrete Situation, Vorgabe fehlt

3.3 Zielniveau 1. außerdem nicht jedes Kundengespräch läuft nach Schema F ab, die Leute müssen sich auf die Situation einstellen können, in diesen ganzen Selbstbedienungsgeschäften ist die Gesprächseröffnung und die Gesprächsvorbereitung wohl nicht so wichtig, auf Anwendungsebene heben

3.4 a) Zielniveau 1, was macht er aus der Antwort, darum geht es! b) find ich nicht so schlecht, würde nur die Angabe etwas reduzieren, dass ein Kunde gleich so viel sagt, ist eher unwahrscheinlich, wichtiger ist, ihm das Richtige "aus der Nase zu ziehen"

3.5 kaum abprüfbar (standardisiert)

5.1 konkreteres Beispiel fehlt

5.2 Das Beispiel mit dem Marburger Werbebrief find ich gut, in dem Sinn, dass wir es beim Bürokaufmann auch immer so prüfen, weil es in der Prüfungsordnung ist, die praktische Relevanz - auch unserer Beispiele traue ich mich nicht zu beurteilen, in kleinen Betrieben ja, in großen macht es das Marketing. Die Arbeitsanweisung verlangt einen Werbebrief, Lösung ist eher Flyer - sollte man Übersetzung checken

7. Finde ich vom Sinn her gut, Qualitätssicherung ist so wichtig, vor allem, dass die Leute zum "Mitdenken" erzogen werden. Von der Art der Aufgabe glaube ich, dass "unsere" dabei Probleme haben könnten, müsste man jedenfalls trainieren bzw. Beispiel konkreter machen.

Expert B:

ich kann mir nicht vorstellen, dass die Kaufleute der teilnehmenden Länder das Alles können, wenn sie fertig sind!

Expert C:

Ich möchte noch darauf hinweisen, dass die Komplexität eher auf die Art der Fragen bezogen ist, als auf ihren Inhalt. Der Bereich Kundenbetreuung findet in dieser praktischen Form weder im Unterricht, noch in der LAP (Lehrabschlussprüfung) eine Entsprechung. Diese Bereiche sind in Österreich Teil der LAP für den Handel und würden dort auch repräsentativ sein und einem angemessenen Komplexitätsniveau entsprechen.

Expert D:

Bemerken möchte ich auch noch, dass die Formulierung der Fragen manchmal konkreter sein müsste.

Expert E:

Aufgabe 1: Für jemanden, der gerade seine Lehr-/Fachschulausbildung abgeschlossen hat, scheint mir diese Aufgabe zu kompliziert und zu komplex zu sein.

Aufgabe 2.3: siehe oben

Der Aufgabenbereich 3 enthält Bereiche, die bei uns im Lehrberuf Bürokaufmann/-frau eigentlich keine/kaum Relevanz haben; viel eher beim Lehrberuf Einzelhandel zu finden sind. Im Besonderen trifft dies für die Aufgaben 3.1, 3.3 und 3.4 zu.

Zudem fehlt mir bei den Aufgaben 3.1, 3.2 und 3,5 die konkrete Angabe, das tatsächlich auszuarbeitende Prüfungsbeispiel.

Das oben Erwähnte gilt auf für Aufgabe 5.1 – zu komplex, keine konkrete Aufgabenstellung

Aufgabe 7: Ob bei dieser Aufgabenstellung der Prüfling wirklich erfasst, was von ihm verlangt ist, welche Antworten er geben soll, bezweifle ich.

Zusammenfassung: Mir scheinen die österreichischen Beiträge praktikabler, mehr auf die reale Situation Bezug nehmend zu sein. Die von mir kritisierten Aufgaben wirken auf mich insgesamt zu abgehoben.

Expert F:

Die Beispiele 3.1, 3.2, 3.5, 5.1. sind im Bereich der Vollzeitschule (z.B. Handelsschule) NICHT umsetzbar. Mir fehlt bei diesen Beispielen auch eine konkrete Aufgabenformulierung.

Insgesamt müssten alle Beispiele noch einmal hinsichtlich Rechtschreibung (Neue Rechtschreibung!) und Tippfehler überprüft werden.

Expert G

Alle Beispiele mit Kundenverkehr, Prüfung am Arbeitsplatz,... sind für mich als nicht zustimmbar / nicht beantwortbar zu bewerten, da in den Lehrplänen für Büro-/Industriekaufleute nicht explizit enthalten + auch für die (schriftlichen) Lehrabschlussprüfung nicht relevant.

Authors: Lorenz Lassnigg, Elisabeth Riebenbauer, Peter Slepcevic, Mario Steiner & Stefan Vogtenhuber

Title: Feasibility Study VET-LSA. A comparative analysis of occupational profiles and VET programmes in 8 European countries.

Austrian National Report

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Stumpergasse 56, A-1060 Vienna • ☎ +43 1 59991-0 • Fax +43 1 59991-555 • <http://www.ihs.ac.at>
