Psych-Fit for Future? The Role of Soft Skills in Academic and Professional Education

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Abstract

In addition to the acquisition of knowledge, nowadays also psychological skills (so-called soft skills) are playing an increasingly important role even at high school. An increasing number of high school graduates attend university after finishing high school, even if their skills would be more suited to a vocational training. However, about one third of first-year students drop out of their bachelor studies (Heublein & Schmelzer, 2018). A skill-based choice of vocational training or academic studies might prevent potential problems arising from the unsuitability of skills and requirements.

For a successful completion of vocational training, social skills such as communication and group skills seem to be even more important than for the completion of academic studies which rather focus on cognitive and self-management skills. Pupils who expressed a preference for vocational training judged their own flexibility and contact skills (measured by the Mini-ICF-APP-S capacity rating; Linden, Keller, Noack & Muschalla, 2018) significantly higher than pupils who expressed a preference for academic studies. Pupils preferring academic studies had a small tendency to perform better in the school subjects of natural sciences, while both groups (those preparing for academic studies as well as those preparing for vocational training) showed similar grades in the school subjects social sciences, arts and languages. In order to succeed in later professional life, which is currently strongly characterised by team structures, social skills training should also take place in academic education by means of discussions, group work or presentations.

Keywords

School, pupils, high school students, career choice, eligibility, academic studies, vocational training, ability training, soft skills, capacities

Psych-Fit for Future? Die Rolle von Soft Skills in Schule, Studium und Berufsausbildung

Kurzfassung

Auch in der Schule spielen neben dem Wissenserwerb zunehmend psychische Fähigkeiten, sogenannte Soft Skills, eine Rolle. Immer mehr Abiturienten gehen nach ihrem Schulabschluss an die Universität, auch wenn ihre Fähigkeiten eher zu einer Berufsausbildung passen würden. Etwa ein Drittel der Studienanfänger brechen jedoch ihr Bachelorstudium ab (Deutsches Zentrum für Hochschul- und Wissenschaftsforschung, Heublein & Schmelzer, 2018). Eine fähigkeitsgerechte Wahl der beruflichen Ausbildung kann mögliche Probleme verhindern, die durch Nichtpassung von Fähigkeiten und Anforderungen entstehen. Für erfolgreiches Absolvieren einer praktischen Berufsausbildung scheinen soziale Fähigkeiten wie Kommunikations- und Gruppenfähigkeit noch bedeutsamer zu sein als für das Absolvieren eines Studiums, bei dem kognitive und Selbstmanagementfähigkeiten im Vordergrund stehen. Schüler, die eine Präferenz für eine Berufsausbildung äußerten, schätzten sich in ihrer Flexibilität signifikant besser ein als Schüler, die eine Präferenz für ein Studium hatten. Bei Studiums-Präferierenden zeigte sich eine Tendenz zu besseren Leistungen im naturwissenschaftlichen Bereich, während in sozialwissenschaftlichen, musischen und sprachlichen Fächern bei Studiums- wie auch Berufsausbildungs-Präferierenden ähnliche Leistungen in beiden Gruppen vorlagen. Um im späteren Berufsleben, welches gegenwärtig stark von Teamstrukturen geprägt ist, gut zurechtzukommen, sollte auch in der akademischen Ausbildung soziales Fähigkeitentraining durch Diskussionen, Gruppenarbeiten oder -präsentationen erfolgen.

Schlüsselwörter

Schüler, Berufswahl, Eignung, Studium, Berufsausbildung, Fähigkeitentraining

1 Skill requirements for vocational training and academic studies

The transition to adulthood is a challenge for many young people. Important decisions are made with regard to career paths. Additionally, about a quarter of young adults has impairments in the form of a chronic illness (Fuchs & Karwautz, 2017; Gesundheitsberichterstattung des Bundes, 2017; Hackauf & Quenzel, 2019; Schulte-Körne, 2016; Steffen, Akmatov, Holstiege & Bätzing, 2018). Psychomental performance and psychological skills demands are of particular interest in the transition from school to the professional world, choosing academic studies or vocational training.

Within the current idea of academisation there is an increased tendency to graduate from high school (and thereby to obtain the Abitur, the German university entrance qualification, comparable to the Advanced Level) and then to take up academic studies instead of vocational training. As a result, many companies are unable to find trainees and there is a considerable shortage of skilled workers in the manual tertiary sector. An increasing number of high school graduates are attending university, even if their skills would be more suited to vocational training. Consequently, about one third of first-year students drops out of their bachelor's degree programmes (Heublein & Schmelzer, 2018). Choosing a career that is appropriate for their abilities can prevent potential problems that arise as a result of the misfit of skills and requirements.

Against this background, the question arises as to which abilities of pupils are attended by which performances, and which skill requirements exist in different subject areas that can provide guidance for choosing a profession or a course of study.

2 Which skills of pupils come along with good academic performance?

Academic performance is influenced by a variety of factors (Gathercole, Pickering, Knight & Stegmann, 2004; Hen & Goroshit, 2014; Linck, Osthus, Koeth & Bunting, 2014; Linnenbrink & Pintrich, 2002; Qualter, Gardner, Pope, Hutchinson & Whiteley, 2012; Richardson, Abraham & Bond, 2012; Salovey, Kokkonen, Lopes & Mayer, 2004; Trapmann, Hell, Hirn & Schuler, 2007; Vedel, 2014). Many studies have identified *conscientiousness* as a fundamental personality aspect related to good academic performance (Trapmann et al., 2007). Conscientiousness is a feature of the five-factor model of personality and indicates the tendency to pursue goals in an organised, determined, controlled and motivated manner (Costa & Widiger, 1994; McCrae & Costa, 1991). However, the importance of conscientiousness seems to vary from school subject to school subject (Vedel, 2014).

Emotional abilities are also important for academic performance, for example the ability to perceive, use, understand and influence emotions (Salovey et al., 2004; Qualter et al., 2012). The more pronounced the emotional abilities, the higher the academic self-efficacy (Hen & Goroshit, 2014). Academic self-efficacy can be classified as part of motivational abilities and is associated above all with *stamina* in difficult tasks and the application of *self-regulation strategies* (Linnenbrink & Pintrich, 2002; Richardson et al., 2012). Another motivational aspect is the grade goal, i.e. the individually set minimum requirements for one's own performance (Richardson et al., 2012).

Working memory functions are also related to performance, e.g. in mathematics, English and natural sciences (Gathercole et al., 2004; Linck et al., 2014).

3 Which skill demands does the modern school system make for pupils?

Demands on mental performances are not only made in the modern working world, but also at school. In addition to academic skills (decision-making and judgement, application of professional skills in individual subject areas), so-called soft skills, social skills (e.g. interpersonal skills, group skills, self-empowerment), and management skills (e.g. flexibility, planning and structuring) are demanded. Schooling concepts require teachers to define "competence-oriented learning goals" beyond the transfer of knowledge.

For example, different subjects have different skill requirements for pupils, or even train certain different skills. The skills that are expected of pupils in specific subjects in high school are described in the core curriculum of the respective federate states' Ministries of Education and Cultural Affairs. The aim is to prepare pupils appropriately for the Abitur examinations, but also to convey basic skills that will later enable them to participate responsibly in socially relevant decisions.

In the area of "knowledge gain", pupils should, for example in *biology*, observe, de-

scribe and compare complex biological facts appropriately. To this end, they should develop questions and hypotheses and embed these in the planning and execution of experiments. They should be able to explain biological facts with reference to models and form a well-founded judgement about the validity and significance of this model. In addition, they should be able to analyse scientific texts in a professional manner and master the transfer of scientific knowledge to new topics.

In the competence area "communication", pupils are expected to present a coherent and structured linguistic presentation in oral and written form. The ability to communicate is required in order to participate in discussions and to develop a confident use of biological terminology. Additionally, modern communication and presentation techniques should be proposed and used by the pupils. It is emphasised, that self-control and self-organisation of the learning process are characteristic features of teaching and the essential prerequisite for communication (Niedersächsisches Kultusministerium, 2017a).

The competence area "assessment" requires pupils to be able to derive a deliberated and critical assessment of biological processes with reference to factual and ethical arguments. Above all, aspects of sustainable development should be discussed critically so that the pupils can participate responsibly in socially significant decision-making processes.

The comparison of competence areas and skills (Table 1-3) shows that, in addition to classical cognitive skills, pupils are also expected to possess certain soft skills, which are particularly important in the competence area of "communication". Contrary to the initial assumption that more scientific subjects mainly expect cognitive abilities and performance, it becomes adherent that the skill requirements are more holistic and extensive. These extensive skill requirements for pupils can be explained with the aim of high school. The aim of the Gymnasium (secondary school, high school) is to provide pupils with a broad and in-depth general education in order to acquire the "general ability for academic studies" (Niedersächsisches Kultusministerium, 2019).

Defined competence and ability requirements for subjects in the field of music and the arts, for example in the *subject drama*, do also exist. In terms of "professional competence", pupils should demonstrate basic theatrical knowledge and skills which can be used to realise and understand their own and others' creative ideas. The "ability to create" expects the pupils to design and implement complex scenic concepts and to critically reflect them in the group. Important decisions should be made jointly by the group. As part of "Communication through aesthetic devices of drama", the pupils should discern the communication levels of theatre in a differentiated way. In addition to the description, analysis and evaluation of theatrical signs, competencies in the area of social communication and feedback should be practiced. The pupils should learn to appropriately accept and reflect feedback and criticism as well as to sensitively discern and formulate conflicts. Moreover, they should be able to reflect on themselves and their actions and to formulate and justify this self-reflection. "Sociocultural participation" stands for experiencing the cultural significance of theatre. For this purpose, the pupils should describe, analyse, compare and reflect on plays and their social function.

Table 1

Skill requirements in the school subject biology in Germany

Core curriculum for biology according to the Ministry of Education and Cultural Affairs of Lower Saxony (Niedersächsisches Kultusministerium, 2017a)	**Skills according to the Mini-ICF-APP soft skills rating (Linden et al., 2018)**
Competence area "Knowledge gain"	• Ability to plan and structure tasks • Application of competence and knowledge • Ability to adjust to rules and routines • Proactivity and spontaneous activities • Endurance and resistance • Mobility
Competence area "Communication"	• Conversation and contact with third parties • Assertiveness • Group integration • Dyadic relationships • Self-care
Competence area "Assessment"	• Application of competence and knowledge • Decision-making and judgment ability

Table 2
Skill requirements in the school subject drama in Germany

Core curriculum for drama according to the Ministry of Education and Cultural Affairs of Lower Saxony (Niedersächsisches Kultusministerium, 2017b)	Skills according to the Mini-ICF-APP soft skills rating (Linden et al., 2018)
Professional competence	• Application of competence and knowledge
Ability to create	• Group integration • Ability to plan and structure tasks • Assertiveness • Decision-making and judgment ability • Flexibility
Communication through aesthetic devices of drama	• Group integration • Conversation and contact with third parties
Sociocultural participation	• Application of competence and knowledge • Decision-making and judgment ability
Individual competence	• Endurance and resistance • Ability to adjust to rules and routines • Self-care
Social competence	• Group integration • Conversation and contact with third parties
Media literacy	• Ability to plan and structure tasks • Decision-making and judgment ability

In addition to technical skills, interdisciplinary skills are also learned: "Individual competence" includes identity-building processes, the development of independence and responsibility through the joint planning and creation of plays, as well as the development of self-motivation and stamina to achieve the common group goal. In line with "social competence", the pupils are to learn to work in a team and develop the corresponding communication and conflict management skills. Through the intensive work together they should learn to empathise with others and develop mutual tolerance. Through critical and versatile use of different media, the pupils should plan the application of media in plays independently and thus acquire a certain "media literacy".

Group and communication skills are more important in drama than in biology. The focus on soft skills in drama can be primarily explained by the context of the subject, which is less scientific but culturally practical and requires more teamwork.

A variety of different skills are expected of pupils in *physical education*. In addition to sport-specific competencies, which are defined according to the type of exercise such as "swimming, diving" or "running, jumping, throwing", certain methodological, social, self and content-related competencies are expected.

Within the framework of "methodological competence", pupils should learn to solve movement-related tasks (Niedersächsisches Kultusministerium, 2018). For this purpose, they are to learn to analyse problems, work out solutions, carry out experiments and present results appropriately. In addition, pupils are encouraged to plan, organise and design exercises and game situations in order to receive and deliberate the subsequent feedback. "Social competence" requires pupils to behave fairly towards others, to use their teamwork and communication skills meaningfully, to take responsibility for others and themselves, and to use various strategies for conflict resolution. As part of "self-competence", pupils should possess the ability to differentially perceive their own person (self-image), their own body (body image, posture, body language) and their own and others' possibilities for action and movement (Niedersächsisches Kultusministerium, 2018). In addition, they should set appropriate goals for themselves and control their "movement actions" accordingly.

In the area of "content competence", pupils are to show that they are able to cope with a wide range of sport-specific tasks. This includes, for example, the demonstration of motor skills required for a certain sport, the application of explanatory models and test methods from various disciplines of sports science, but also knowledge, attitudes and values in connection with important contemporary sports-related topics beyond the boundaries of the discipline itself, or the ability of interdisciplinary thinking and to independent learning, reasonable judgments and actions.

Similar to drama, physical education primarily requires social skills such as group skills. This can be explained by the team character of numerous popular sports (volleyball, basketball, handball). However, skills such as

Table 3
Skill requirements in the school subject physical education in Germany

Core curriculum for physical education according to the Ministry of Education and Cultural Affairs of Lower Saxony (Niedersächsisches Kultusministerium, 2018)	Skills according to the Mini-ICF-APP soft skills rating (Linden et al., 2018)
Methodological competence	• Ability to plan and structure tasks • Application of competence and knowledge • Decision-making and judgment ability
Social competence	• Conversation and contact with third parties • Group integration • Assertiveness
Self-competence	• Endurance and resistance • Self-care
Content competence	• Application of competence and knowledge
	• Ability to plan and structure tasks

self-care and self-sufficiency are equally important in order to achieve the defined goal of a differentiated perception and assessment of one's own body. Furthermore, skills such as stamina and self-assertion are also necessary.

Overall, by comparing the three school subjects described, it can be concluded that the skill requirements for the pupils in all subjects are broad. All three subjects require and train academic skills as well as soft skills and management skills. Different emphases are set depending on the subject.

4 Decision between vocational training or studying at university/polytechnic

In recent years, an increasing number of young people have decided to study at a university or polytechnic instead of pursuing vocational training. In 2017, 1.3 million people were in vocational training (Statistisches Bundesamt, 2017a). At the same time, 2.8 million people were enrolled at German universities or polytechnics (Statistisches Bundesamt, 2017b). However, the usefulness of nationwide academisation is sometimes viewed critically, especially since calculations based on the class of 2016 showed that about one third of first-year students who took up their studies in 2012/2013 dropped out of their undergraduate programme (Heublein & Schmelzer, 2018). A consequence currently noticeable, possibly partly caused by the academisation, is a skills shortage in Germany, especially in technical professions, but also in construction professions and health and nursing professions (Bundesagentur für Arbeit, 2019c). Aspects such as demographic change, a change in attractiveness of various occupational fields or low birth rates also influence this development (Püls, 2016). In recent years, the education system has adapted to the need for higher qualifications and skills of employees (Püls, 2016) due to the increasingly complex world of work (Kauffeld, 2011). This adaptation leads to an increase in the proportion of those who receive a university entrance qualification, and potentially more people have the opportunity to take up academic studies (Püls, 2016). The labour market is particularly attractive for academics. On average, academics have better promotion prospects and are less affected by unemployment (Bischoff-Wanner, 2002). In financial terms, too, academics have advantages over employees with a vocational qualification, as they earn on average €860,000 more than the latter during the course of their employment. At this point, it is interesting to compare the average lifetime income of high school graduates with a university degree with this of high school graduates without a university degree and with or without vocational training. This comparison is useful insofar as only the group "high school graduates without a university or polytechnic degree" would have had the opportunity to study. The average life earnings of a graduate of a polytechnic are at a gross pay of €2,002,000. By contrast, university graduates earn an average of €2,319,936 gross pay in their lives, whereas high school graduates with or without vocational training end up with a total of €1,560,831 in lifetime earnings (Schmillen & Stüber, 2014). On average, the decision to pursue a university/polytechnic degree after high school graduation makes a financial difference of €600,137. However, it should be noted that there are increased costs during the course of study, which often result in BAföG repayments (Germany's Federal Training Assistance Act for students at secondary schools and universities in Germany), whereas most trainees already earned money, as well as potentially higher tax rates to be paid by higher-income earners. After completing a master programme, students are employed

on average within three to four months. However, in fields such as psychology, social or political sciences and humanities, transitional periods of six months may occur (Bundesagentur für Arbeit, 2019a, 2019b). Just 5.7% and 13.6% of those who completed their vocational training in 2013/2014 were affected by four months' and one to three months' unemployment, respectively. The majority (80.8%) entered working life without a break of unemployment (Seibert & Wydra-Somaggio, 2017).

Academisation is being particularly intensively discussed in the health sector, especially with regard to healthcare and nursing. Increasing numbers of patients, the growing incidence of chronic diseases, increasingly complex care, the need to relieve physicians of daily routine tasks or the publicly demanded improvement in the quality of care are just a few of the many arguments supporting an academisation of nursing education towards a university level. The attractiveness of the nursing profession for future high school graduates might be increased through the possibility of studying "nursing" at university (Becker & Jahn, 2017). The trend towards academisation seems to be put on the spot here which, in addition to technical arguments, is accelerating the creation of degree courses. The valuable transfer of medical subtasks to nursing staff can only take place on condition that nursing staff has received appropriate training (Wedler, Jahn & Landenberger, 2015). The goal of "evidence-based care" is to be achieved with newly created degree courses in which the prospective nursing staff attends lectures together with medical students (Becker & Jahn, 2017). Undergraduate programmes such as "Physician Assistant" or a bachelor degree in "Applied Nursing Science" as well as a degree in "Evidence-Based Nursing" are intended to train nurses with an academic background. However, monthly tuition fees of €300-510 make it difficult to take up these degree courses (Wedler et al., 2016). Most graduates of academic nursing courses, however, are employed in management rather than actual clinical care following their studies. Nonetheless, as the size of hospitals increases, the graduates' remits grow. Acceptance of this change by hospitals thus plays a key role in the successful implementation of the academisation of the nursing profession (Schöps, Landenberger & Jahn, 2015; Wedler et al., 2016). The implementation of academisation to new occupational groups must therefore be categorised as a complicated and lengthy procedure, at least for the nursing sector.

The successful completion of vocational training requires different skills of young people than academic studies. Since the German apprenticeship system is unique, there is no international literature or scientific research on the skills that are required in the context of vocational training. However, the Federal Employment Agency (Bundesagentur für Arbeit, 2009) describes various characteristics that are central to training maturity. On the one hand, this refers to basic skills in writing, reading and speaking. This also covers basic mathematical and economic skills. On the other hand, intellectual power is also considered. Applicants for vocational training should have the ability to think logically, have a certain retentiveness and processing speed, as well as vigilance. Concerning physical condition, physical development in accordance with age is expected. Social skills are central to training maturity. Trainees should have a certain amount of stamina, be able to work in a team and have the appropriate communication, conflict and criticism skills. Reliability and a sense of responsibility are also expected from the trainees. They should be familiar with social manners and act carefully. Finally, the ability to assess and inform themselves, to act independently, is required in order to be able to speak of possessing the maturity to choose a career.

These skills coincide with those named in qualitative surveys of former trainees. They also mention the necessary willingness to work shifts and to physical exertion and the acceptance of hierarchies. Reliability, punctuality, an interest in customer contact and friendliness are also rated highly, which can be explained by the frequent connection between vocational training and the service sector. In addition, aspects such as resilience, stamina, stress resistance, but also frustration tolerance and the ability to remain calm even when confronted with uncertainty were considered essential for vocational training.

However, the primary ability required to successfully complete a degree course is another one. In addition to thematic interest, accuracy, determination and perseverance are specified. Moreover, the ability to become active on one's own initiative and to organise oneself and one's tasks are considered to be essential. In addition, students should have a high level of ambition, be competent in dealing with uncertainty and have the ability to reflect themselves (University of Passau, n.d.). However, mastering teamwork is essential for effective learning and working in later life (Crebert, Bates, Bell, Patrick & Cragnolini, 2004). In a survey, graduates assessed the importance of different learning contexts (uni-

versity, internship, professional life) for the development of their general skills. It appeared that interactive group learning at university was understood as essential for the development of job-related skills. Apart from that, it became apparent that the university context is more focused on individual performance and goals and that group work is not necessarily needed to study successfully. However, the use of working groups has increased in recent decades due to a change in values in the world of work and the increased need for expert cooperation (Kauffeld, 2011) and requires corresponding social skills, which should also be promoted at university. Possible contexts where communication skills can be trained at university are presentations, discussion groups or even mandatory group work. These can help to prepare students for job interviews in the application process or for teamwork in the workplace (Iksan et al., 2012). A meta-analysis on the relationship between various skills and the average student grade showed that it is primarily the assessment of one's own self-efficacy in terms of performance that is related to student grades (Richardson et al., 2012). The expectation regarding one's own performance depends on whether the challenge is known and whether an expectation regarding performance can be formulated from prior experiences. If one cannot base one's expected performance's assessment on experience due to a lack of familiarity with the task, the assessment is based on a general assessment of one's own abilities (the so-called academic self-efficacy). The grade target (self-imposed minimum goal), as well as effort regulation (controlling effort and the ability to persevere even in difficult tasks), are also important for academic success (Richardson et al., 2012).

5 Skill profiles of pupils choosing a profession or degree course

A survey of pupils (average age of 16.7 years (SD=1.07), grades 10-13, 70% female) who attended an orientation day at a university in Germany in June 2019 (n=56), as well as eleven-graders at a German high school (n=55) collected information on the self-assessed skill profile according to the capacity self-rating Mini-ICF-APP-S (Linden, Keller, Noack & Muschalla, 2018), school performance (last report marks) and current preferences regarding academic studies or vocational training.

Pupils who expressed a preference for vocational training (21.6%) judged their flexibility and adaptability higher than pupils who expressed a preference for academic studies (78.4%) (Figure 1, $p=.070$). Pupils who preferred academic studies did not have significantly higher grades than those who preferred vocational training (Figure 2). There was only a small but not significant tendency to perform better in the school subjects of natural sciences in pupils preferring academic studies.

Boys judged some of their skills on the Mini-ICF-APP-S higher than girls: Resilience and stamina, flexibility, self-assertion. Girls had better grades than boys in the subjects of German language, music, arts, physical education, religion and biology; boys had better grades in physical education.

Skills were *not* related to the number of days pupils were absent due to illness during the last school year (M=7.15, SD=9.70). According to the pupils' self-reports, absences were mainly due to physical complaints (82.3%). Psychological complaints (5.9%), or a mixture of psychological and physical complaints (11.8%) were mentioned less frequently.

6 Summary and conclusion

In conclusion, it can be noted that social skills such as communication and group skills seem to be more important for a successful completion of vocational training than for the completion of a degree course. The pupils surveyed who were oriented towards vocational training seem to perceive themselves as relatively competent, particularly considering their ability to interact in dyadic relationships. However, in order to cope well in later working life, which is currently strongly characterised by team structures (Handke & Kauffeld, 2019; Schulte & Kauffeld, 2017), social skills training through discussions, group work or presentations should not be ignored in academic education either.

In academic studies, self-efficacy, cognitive performance and self-organisation are of primary importance. However, in our convenience sample no significant superiority in performance (school subjects grades) was found in pupils with preference for academic studies as compared to those who preferred vocational training.

Further research with larger heterogeneous samples of career starters should be undertaken to identify prototypes of fits of skills and demands.

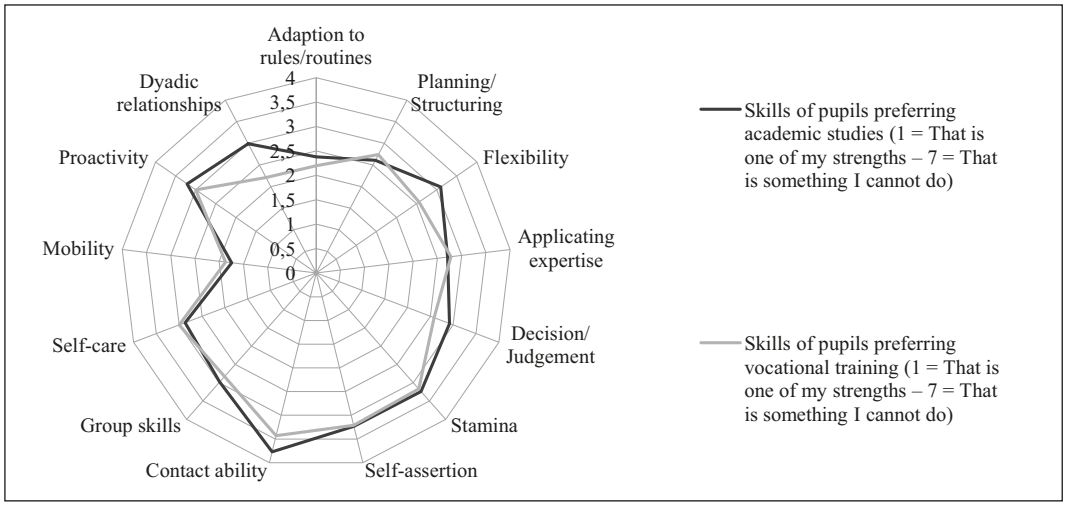

Figure 1

Skill profiles according to Mini-ICF-APP-S (Linden et al., 2018): Pupils preferring vocational training (n=24) and pupils preferring academic studies (n=87)

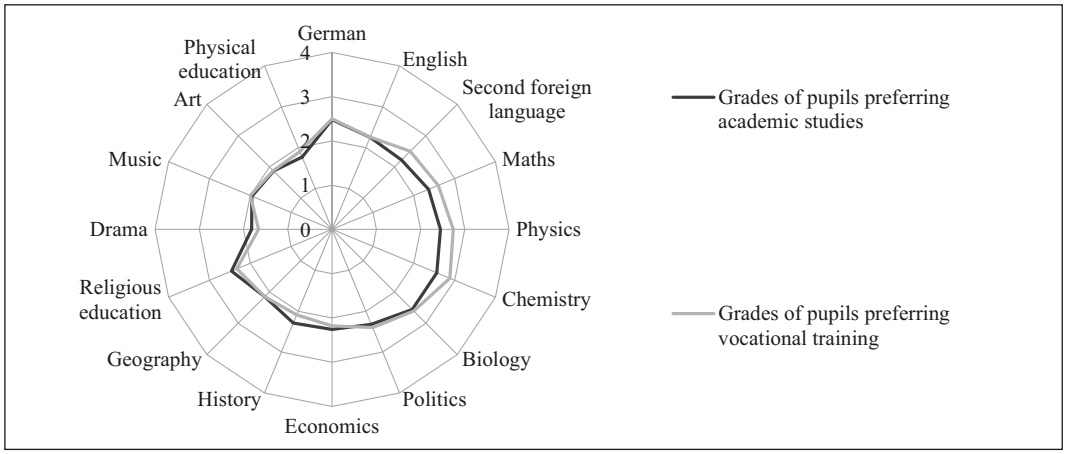

Figure 2

Recent grades in school subjects of pupils preferring vocational training (n=24) and pupils preferring academic studies (n=87)

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