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Research Report

University of Cooperative Education – Karlsruhe: The Dual System of Higher Education in Germany

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This paper describes the acceptance of German *Berufsakademie* or *University of Cooperative Education* graduates in the job market. This system, unique to this kind of university in Germany, combines theory and practice in equal parts. The first part of this paper describes this 'dual' system of education and provides a general overview of its history and the special features that make this model so effective in Germany. The second part of the paper describes the Berufsakademie Karlsruhe, its faculties and the importance of its location in one of Germany's most advanced high-technology areas. The paper concludes with the presentation of some research findings for an empirical investigation, which shows that Berufsakademie graduates are highly sought after by their training companies and other employers. The research suggests that graduates are in demand because they are able to do responsible tasks soon after graduation without the need further training (*Asia-Pacific Journal of Cooperative Education, 2002, 3(2), 53-58)*.

Keywords: Germany; program description; technology; engineering; business; employer evaluation

In the last two decades cooperative education at the tertiary level has become increasingly important worldwide. The growth of cooperative education is impressive and, for example, Aleisa and Alabdulahfez (2002) point to the development of cooperative education in the United States where they report that more than 97,000 companies, enterprises and government agencies are now involved in such programs. Cooperative education is not confined to science and engineering and it also occurs in the leisure studies, hospitality and sport studies. Ferkins (2002), for example, reported recently on an investigation into best practice for student work placements in sport studies in New Zealand tertiary institutions.

The *University of Cooperative Education* or Berufsakademie institutional system was established in Germany as a new model of work-integrated learning at the tertiary level. The aim of the Berufsakademie is to transfer the traditional German system of dual vocational training to higher education. Traditional dual vocational training refers to the professional training of young employees, after finishing secondary school, especially young employees who do not have access to higher education[1].

In 1972, cooperating with three global companies - Bosch, Daimler Benz (today Daimler-Chrysler) and Standard Elektrik Lorenz (SEL) - an initiative was started to develop a system of dual education for secondary school graduates and to apply the principles of the dual system of vocational training to the fields of business and engineering at the university level. This development resulted from a demand for high-level skills that research universities were deemed unable to satisfy. The feeling at the time was that existing vocationally oriented tertiary institutions like the *Universities of Applied Sciences* could not guarantee to meet the needs of industry.

In 1974 Baden-Württemberg, one of the economically most successful states of the Federal Republic of Germany, launched a new project and founded the, at the time, new state-run Berufsakademie.[2] These institutions offered study programs in the field of *Business Administration*, *Engineering* and *Social Work*.

A student enrolled at the Berufsakademie is both a student and an employee, and carries out periods of course work at the university alternating with on-the-job-training. Each period of work usually takes 12 weeks and each term consists of one practical component and one theoretical component.

[1] In Germany these apprentices or trainees in average work four days a week in their company and one day they attend a vocational school that guarantees practical and theoretical experience.

[2] Baden-Württemberg itself now has eight Berufsakademien. The model has been adopted by other federal states so that there are now 18 Berufsakademien in Germany following the model of Baden-Württemberg.

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The requirement for studying at the Berufsakademie is the German university entrance examination (known as *Abitur*). In addition, the student has an employment contract with one of the companies or enterprises the Berufsakademie is cooperating with: this is one of the key points of the model. The student is enrolled at the partner company - where he or she has to be accepted for employment based on an interview - rather than at the Berufsakademie. Signing a standard training contract is a necessary condition of enrolment. The Berufsakademie student receives remuneration during the whole course. That means that hosting a Berufsakademie student is expensive for the employer and this 'investment' has to be profitable. On the other hand, the company is regarded as an equal partner with the university and as such exerts a continuous and important influence on the learning institutions' organisation and curricula.

After three years the student finishes his or her studies with the German *Diplom*.[3] As from 2001, Berufsakademie graduates are able to take out a Bachelor (Hons) from the Open University of London - accepted as equivalent to a Berufsakademie Diplom. In 2001 this option was exercised by 95% of the Business Administration graduates and by 86% of the Engineering graduates nationally.

History of the Berufsakademie Karlsruhe

The Berufsakademie Karlsruhe was founded as a University of Cooperative Education in 1979 by the Government of Baden-Württemberg. It started with 32 companies training 45 students and now it has more than 900 participating companies responsible for training 1,800 students. About one third of these students study engineering, and the remainder business.

Courses take place in groups of up to 30 students. This system enables the students to have close contact with teachers during lectures and practical work. Lectures are held in a seminar-style intended to enhance teacher-student interaction in the classroom. This feature is typical of the intensive education offered by all Berufsakademies throughout the country.

Practice-orientated specialisation is completed by an extensive range of courses in theory and practice, and by the use of teaching technologies including modern multi-media technologies. Many teachers are industry-based professionals, who bring industry expertise into the classroom. This innovative way of recruiting university staff guarantees training that fulfils the requirements of industry and provides instruction that is cognisant with current industry developments.

Karlsruhe is located in the southwest of Germany, on the border to France, and its harbour on the River Rhine (the River Rhine is one of the most important inland ports in Germany). The Berufsakademie Karlsruhe has a large number of high quality partner companies. This is in part due to its location in Karlsruhe - a region well known for high-technology industries.

The Berufsakademie Karlsruhe is equipped with state-of-the-art technical instruments and facilities including a CAD-centre and a model or pilot plant in which the students are able to learn to handle different aspects of production engineering and associated administrative problems.

In the Faculty of Business Administration, the Berufsakademie Karlsruhe offers six courses: *Banking*, *Management in Trade*, *Management in Industry*, *Accountancy*, *Taxes*, *Auditing*, *Insurance*, and *Business Information Systems*. There are also six courses offered in the Faculty of Engineering: *Electrical Engineering*, *Mechanical Engineering*, *Information Technology*, *Engineering* (including *Radiation Protection*, *Environmental Engineering*, *Safety at Work*, *Paper Technology*, *Event-* and *Production-Engineering*), *Mechatronics* and *Business Engineering*.

Employers Evaluation of Berufsakademie Karlsruhe Mode of Education

In order to evaluate the efficiency of this relatively new model of education, in 1991 a questionnaire was developed and used to investigate the cooperating companies assessment of their trainees from Berufsakademie Karlsruhe. A total of 577 companies were invited to take part in the investigation, from which a response rate 42% was obtained. One of the most important findings was that the partner companies routinely employ Berufsakademie Karlsruhe graduates on a permanent basis upon graduation.

The study showed that overall only 13% of the Berufsakademie Karlsruhe graduates either changed their employers on their own initiative, or were not employed permanently by their training company (88% & 85% for business and engineering respectively, see, Göhringer, 1992). This is a remarkable result considering that the students' employment contract ends with the end of the course, and there is no guarantee of employment.

Usually Berufsakademie graduates start their career as a 'responsible official' (Göhringer, 1992). Because of their age and limited experience, first-time employees are seldom put in management positions. Nevertheless three to five years after their graduation 50% have reached a management position (Table 1).

The Berufsakademie Karlsruhe training companies also were asked to state their views regarding the employment prospects and development of Berufsakademie graduates relative to graduates from universities of applied sciences, and conventional universities (Göhringer, 1992). The research findings (Table 2) suggest that employers' perceptions of the need for a trainee program rise with increasing theoretical orientation of university education. It is remarkable that only 23% of 178 companies stated that Berufsakademie Karlsruhe students were deemed to need a trainee program before employment.

The cooperative principle of the Berufsakademie is clearly approved by the overwhelming response concerning the immediate employment after the graduation.

[3] This degree should not be confused with the diploma common in English speaking countries. The German 'Dipom' is a higher academic level program, equivalent to degree level in other countries

Table 1
Positions held by Berufsakademie Karlsruhe students during training and three to five years after graduation (n=194-242)[1]

Position	Position during training (%)	Position 3-5 years after graduation (%)
Official in Charge	22	1
Responsible Official	47	17
Staff Unit	9	10
Expert	9	19
Field representative	6	3
Head of Outdoor Staff	1	6
Head of Outdoor Department	5	33
Management	1	11

[1] Based on a sample of 577 employers; responses to individual items varied

According to the participants in the survey, conventional university graduates are not usually able to do their job without special training (83%): the evidence is less clear about graduates of universities of applied sciences (Table 2).

Training companies were also asked about the training needs of Berufsakademie students (Göhringer, 1992). When asked whether Berufsakademie Karlsruhe students had a higher efficiency in learning than other trainees, 88% of 202 companies answered in the affirmative, while only 12% were of the opinion that Berufsakademie students had no higher efficiency in learning (Göhringer, 1992).

Some 194 companies were asked to name the abilities that distinguished Berufsakademie graduates from their traditional counterparts (Table 2). The ability to apply theoretical knowledge in an industrials setting was deemed most important (29.3%), followed by ability to work in a team (16.5%), ability to cope with pressure (8.5%) and concentration (8.3%). This is an interesting rating and is in agreement with the views of faculty at the Berufsakademie Karlsruhe (see, Göhringer, 1992).

Employers were also asked why they employed Berufsakademie Karlsruhe students, for both business and engineering students. They cited two main reasons; first was the advantage of the professional practice (29.5% & 27.4% for business and engineering students respectively) and second was that the program provided them with the means of employing qualified junior staff (32.6% & 28.7% for business and engineering students respectively). Other reasons cited included the ability to make 'calculated' decisions about staff selection (15.5% & 16.5% for business and engineering students respectively) and the program was seen to provide for an efficient means of recruitment (14.0% & 22.0% for business and engineering students respectively) (Table 3).

Conclusions and Future Trends

It is interesting to note that the research findings reported here for the Berufsakadamie Karlsruhe are similar to other studies worldwide. For example, Aleisa and Alabdulahfez (2002) found similar employer views for a cooperative education program in engineering and technology at the Riyadh College of Technology in Saudi Arabia. Hence, it is perhaps not surprising that the number of students taking part in cooperative education programs is increasing worldwide.

A recent inquiry based at the major multinational corporation IBM (see, Leitl, 2001) suggested that cooperative education graduates show rapid career advancement. This observation also was borne out in the present study at the Berufsakademie Karlsruhe, which found that Berufsakademie students advanced rapidly after graduation (Table 1). An interesting aspect of this observation is the fact that Berufsakademie students at IBM earn more money and hold higher positions than similar colleagues of conventional universities or universities of applied sciences. The investigation of IBM also shows that the graduates benefit in this respect from the short course length.

The German model of cooperative education known as dual education has apparently transferred well in to higher education system and as such provides an efficient way of producing graduates of value to employers in high technology areas. The ability to recruit graduates who already know the company they are working for, and who are able to hold responsible positions without a settling-in period is an important fact for the companies concerning their decision to employ students of a Berufsakademie. The close cooperation of the companies and the Berufsakademie also guarantees a strong connection with the current requirements of the economy. In addition, this is guaranteed by the staffing of the Berufsakademie, that typically employs part-time lecturers drawn from universities, universities of applied sciences and importantly, professionals from companies with expertise in particular fields. The collaborative and innovative way of education in a Berufsakadamie thus leads to motivated young employees well prepared to meet the needs of industry.

In the future international exchange in the field of cooperative or dual education is likely to increase. Evidence for this comes from the literature, where, for example, the collaboration between Ingolstadt University of Applied Sciences (Germany) and the Port Elisabeth Technikon in South Africa (see, De Lange, 2002), provides an excellent means of addressing student and teacher mobility and

exchange in a developing country. This international program comprises four phases; cooperation with the industrial partners, a student exchange program, exchange of postgraduate students and visiting lecturers, and the implementation of Masters programs. In order to increase international exchange in the field of dual education at university level constantly this well-structured program might well serve as a model for future cooperation between developed and developing countries.

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Table 2
Employers' perceptions of the need for further training of Berufsakademie Karlsruhe graduates compared with graduates from other German tertiary institutions (n=194-242)[1]

Criterion	Berufsakademie	University of Applied Science	Conventional University
Necessity of trainee program	23	61	83
Immediate employment at graduation	90	50	24
Earlier ascent to top management:			
-because of professional knowledge	52	25	24
-because of years of personal acquaintance	56	22	24
-not possible because too young at time	52	47	30
Suitable for all positions	60	65	79

[1] Based on a sample of 577 employers; responses to individual items varied

Table 3
Employers' reasons for employing Berufsakademie students (n=194-242)[1]

	Business (%)	Technology (%)	Berufsakademie Total (%)
Advantage of professional practice	29.5	27.4	29.0
Guarantee of qualified junior staff	32.6	28.7	31.5
Reasonable recruitment	2.0	0.6	1.6
Selective training of family members (in small business sector)	4.4	2.4	3.9
Calculated staff selection	15.5	16.5	15.8
Efficient employment of staff	14.0	22.0	16.1
Other	2.0	2.4	2.1

[1] Based on a sample of 577 employers; responses to individual items varied