LENA SIIKANIEMI

Magnetic Metal

Toward a Model for Satisfaction of Education and Career in Vocational Upper Secondary Education and Training of Machinery and Metal Technology in the Lahti Region

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ACADEMIC DISSERTATION

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Interest focuses attention, arouses feelings, steers direction and involves activity.
(Savickas 1999)

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Lahti, April 2005

Lena Siikaniemi

ABSTRACT

This research focuses on the current problem that the machinery and metal sector in vocational upper secondary education and training does not attract enough students. Increasing the attractiveness of vocational upper secondary education and training has been a key goal of education and labor policy development plans in Finland. Changes in national demographics require directing students to those educational fields that are significant for regional and national economic life.

This dissertation aims to create new knowledge concerning the attractiveness of vocational upper secondary education and training. The standpoint of this dissertation is educational design. The main research question is: What model would represent the relationship between and inter-play of the elements and factors of attractiveness in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology? More precisely, the research focuses on the contextual and individual factors influencing the educational and career choices of young students. The researcher defines attractiveness of upper secondary vocational education and training, and the elements of attractiveness. The explanatory factors are the detractors from and contributors to attractiveness.

The theoretical framework for this research consists of three focal theories of career choice and development that place an emphasis on both individual and contextual factors and influences. These theories are the Systems Theory of Career Development by Patton and McMahon (1999), the Social Cognitive Career Theory by Lent, Brown and Hackett (1994) and Krumboltz's Social Learning Theory of Career Development (1979). Theories of interest and interest development have also been used (Krapp 2002b; Lent et al. 1994) as well as prior Finnish research on educational and career choices and other core components of educational program and career path attractiveness.

The research strategy is a constructive case study. The research context is the Lahti Region and the research data was collected from various local stakeholder groups in general schools, vocational institutions and companies. The research uses multiple triangulation, in which both qualitative and quantitative research methodology is used, but the fundamental methodology is qualitative. The empirical qualitative data of this study were derived from short essays of students in the machinery and metal technology field (n=80) and focused interviews with students, career counselors, teachers, head masters, educational managers and representatives from the metal industry (n=13). The questionnaires were completed by students in vocational institutions, comprehensive schools and general upper secondary schools (n=640).

The main product of this research is a model of attractiveness of vocational upper secondary education in machinery and metal technology. The model is composed of three sequential phases in the attraction process, three context levels, elements and factors of attractiveness and of three functional pathways.

The three phases in the process are: educational and career choice, education and training, and transition from school to occupation. Each phase includes three observation levels: microlevel, institutional level and macrolevel. The elements of attractiveness are the Individual, Social System, Comprehensive School, Vocational Institution, Company, Education System and World-of-Work. Elements are general categories that contain 'factors' which contribute to or detract from the overall attractiveness of an educational field and career. The three pathways are: satisfaction with education and career, development path from workplace to educational institution and the interaction path between these settings.

The results of the research show that according to students the primary sources of attractiveness of study places are professionally skilled teachers and a good climate. The primary sources of attractiveness of occupations are a versatile and challenging content of the work. Attracting an individual to a particular education and career path, and sustaining that individual's satisfaction so that s/he remains in the career, requires the parallel development and interaction of working life and educational institutions. The world-of-work and education should form an integrated whole.

This research focuses on the elements and factors in the first and second phase of the attraction process. Additional research is needed to construct the whole model for 'satisfaction of education and career,' which will require the involvement of various stakeholders in education and the world-of-work.

The world-of-work, occupations, the world-of-education and theories of career development are all undergoing related changes. The model proposed on the basis of this research brings new knowledge to the integration and convergence of theory within this dynamic context. The structure of the model in terms of observation levels, elements and detracting and contributing factors provides a construct for further scientific research. Stakeholders can use the model for decision making and also as a framework for mutual development work.

Keywords: attractiveness of vocational upper secondary education and training, career choice and development, interest, machinery and metal technology

TIIVISTELMÄ

Tämän tutkimuksen kohteena on ammatillisen peruskoulutuksen heikko vetovoima, joka kohdistuu Päijät-Hämeessä erityisesti kone- ja metallialalle. Ammatillisen peruskoulutuksen vetovoimaisuuden lisääminen on ollut keskeinen tavoite kansallisissa työvoimapoliittisissa ja koulutuspoliittisissa kehittämissuunnitelmissa. Väestökehityksen myötä tarvitaan toimenpiteitä, joilla pystytään ohjaamaan nuoria niille koulutusaloille, jotka ovat merkittäviä alueelliselle ja kansalliselle elinkeinoelämälle.

Tutkimuksen tarkoituksena on luoda uutta tietoa ammatillisen peruskoulutuksen vetovoimaisuudesta. Lähtökohtina tutkimukselle ovat koulutuksen suunnittelu ja ne kontekstuaaliset ja yksilölliset tekijät, jotka vaikuttavat nuorten koulutus- ja uravalintoihin. Tutkimuksen tavoitteena on luoda vetovoimamalli, jonka avulla pyritään löytämään keinoja vetovoimaisuuden edistämiseksi. Tutkimuksessa määritellään ammatillisen peruskoulutuksen vetovoimaisuuden käsite sekä elementit. Vetovoimaisuutta selittävinä tekijöinä tutkitaan esteitä ja edistäjiä.

Tutkimuksen teoreettisen viitekehyksen muodostavat ammatillisen kasvun teoriat, jotka sisältävät sekä kontekstuaalisia että yksilöllisiä osatekijöitä. Nämä teoriat ovat Systems Theory of Career Development (Patton et McMahon 1999), Social Cognitive Career Theory (Lent, Brown et Hackett 1994) ja Social Learning Theory of Career Development (Krumboltz 1979). Muut teoriat käsittelevät mielenkiintoa ja mielenkiinnon kehittymistä (Krapp 2002b; Lent et al. 1994). Teoriatarkastelussa on esillä myös aikaisempi suomalainen tutkimus, joissa käsitellään koulutukseen hakeutumista ja valikoitumista sekä vetovoimaisuuteen vaikuttavia keskeisiä osatekijöitä.

Tutkimusstrategiana on konstruktiivinen tapaustutkimus. Tutkimus perustuu triangulaatioon, jossa käytetään sekä kvalitatiivisia että kvantitatiivisia aineiston keräämisen ja analysoinnin menetelmiä. Perusmetodologia on kvalitatiivinen. Tutkimuksen empiirinen aineisto on koottu Päijät-Hämeestä. Laadullinen aineisto koostuu kone- ja metallialan opiskelijoiden kirjoitelmista (n = 80) ja teemahaastatteluista (n = 13), joissa haastateltavina oli henkilöitä ammatillisista oppilaitoksista, peruskouluista ja yrityksistä. Kyselytutkimuksessa (n = 640) kohdejoukkona olivat opiskelijat peruskouluista, lukioista ja ammatillisista oppilaitoksista.

Tutkimuksen päätuloksena on ammatillisen peruskoulutuksen vetovoimaisuuden malli, joka jakautuu vetovoimaprosessin kolmeen eri vaiheeseen, kolmeen kontekstitasoon, vetovoimaisuuden elementteihin ja osatekijöihin sekä toiminnallisiin polkuihin.

Vetovoimaprosessin kolme vaihetta ovat: koulutukseen ja ammattiin hakeutumisvaihe, opiskeluvaihe ja siirtymävaihe koulutuksesta työelämään. Jokainen vaihe sisältää tarkastelutasoina mikrotason, instituutiotason sekä makrotason. Vetovoi-

maisuuden elementit ovat yksilö, sosiaalinen verkosto, peruskoulu, ammatillinen oppilaitos, yritys, koulutusjärjestelmä sekä työelämä. Elementit sisältävät osatekijöitä, jotka estävät tai edistävät koulutuksen tai ammatin vetovoimaisuutta.

Malli sisältää kolme toiminnallista dimensiota: koulutuksen ja ammatinvalinnan onnistuminen, elinkeinoelämän ja oppilaitosten kehittäminen sekä elinkeinoelämän ja koulutuksen vuorovaikutus. Tutkimustulosten mukaan opiskelijat pitävät opiskelupaikan vetovoimatekijöinä ammattitaitoisia opettajia ja oppilaitoksen hyvää ilmapiiriä. Koulutusalan vetovoimatekijä on haastava ja monipuolinen työ. Vetovoimaisuuden onnistuminen edellyttää yksilön tyytyväisyyttä koulutukseen ja ammatin valintaan, joka saavutetaan ainoastaan kehittämällä työn tekemisen ja vuorovaikutuksen muotoja sekä elinkeinoelämässä että koulutuksessa. Elinkeinoelämä ja koulutus muodostavat saumattoman kokonaisuuden.

Tutkimuksessa on tarkasteltu pääasiassa vetovoimaprosessin ensimmäistä ja toista vaihetta. Toisen vaiheen sekä kolmannen vaiheen lisätutkimus tuottaa lopullisen ’koulutuksen ja ammatinvalinnan onnistumisen’ -mallin, joka palvelee laajemmin eri toimijoita.

Työelämä, ammatit, koulutus ja myös ammatillisen kasvun teoriat ovat muutoksessa. Tutkimuksessa luotu malli tuo uutta tietoa teorioiden integroimiseen ja konvergenssiin. Mallin jakaminen eri tarkastelutasoihin, elementteihin sekä osatekijöihin mahdollistaa mallin pohjalta tehtävää tieteellistä jatkotutkimusta ja mallin edelleen kehittämistä. Elinkeinoelämän ja koulutusorganisaatioiden toimijat voivat hyödyntää mallia päätöksenteossa sekä yhteisen kehittämistyön viitekehyksenä.

Avainsanat: ammatillisen peruskoulutuksen vetovoimaisuus, ammatillinen kasvu, mielenkiinto, kone- ja metallialan peruskoulutus

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1 INTRODUCTION

1.1 Competition for Students and Skilled Workforce

This research focuses on the current problem that the machinery and metal sector in vocational upper secondary education and training does not attract enough students. Increasing the attractiveness of vocational upper secondary education has been a key goal in national, regional and local development plans for vocational education in Finland at the beginning of the twenty-first century. Changes in national demographics require directing students to those educational fields that are significant for regional and national economic life.

This research is intended to resolve the inconsistent opinions of the various interest groups concerning the factors that contribute to and detract from the attractiveness to students of vocational education and training. This debate has been especially heated in the field of machinery and metal technology, where the decline in the number of students entering training programs has continued to accelerate. Not only is there no consensus about the reasons for this trend but the various interest groups have complained about the actions taken by others in response to it. Industry groups criticize educational institutions and vice versa. Although increasing the attractiveness to students of existing training programs has been a key theme in several developments plans, there has not been an adequate theoretical foundation or data-based rationale for the proposed actions.

This research approaches career choice and development primarily in terms of the effect of local and regional stakeholders. The regional context is the Lahti Region in Southern Finland, where machinery and metal industries are significant business sectors. Their success depends to a great extent on the availability of a skilled workforce. The context of the research is presented in detail in Chapter 2.

The attractiveness of vocational upper secondary education and training has not been defined in earlier research. The definition which is used at the beginning of this research is adapted from Raunio (2002a, 15), who has studied regional attractiveness previously. The attractiveness of an educational sector in this research is defined as the standing of the educational sector in the field of choices of the education seekers. The field of choices consists of the possibilities that the education seekers get to know and which they prefer as their potential study places.

This definition is limited to consideration of student enrolment in educational institutions. A more comprehensive definition has been constructed during this research. In this research attractiveness is viewed not only in terms of student enrolment in a training program, but also in terms of how to get them to remain in training program and how to ensure that they find employment in corresponding

occupational field. The concept of attractiveness can, therefore, be better defined as follows: *the attractiveness of education and career is the inter-play of contributors to and detractors from the individual career choice and development process, which guide the individual towards satisfaction with educational and career pathways.*

Career choice and development are attracting increasing attention from various interest groups because changes in working life require a re-evaluation of both theory and practice. It is difficult to predict the changing patterns of commerce and industry due to the coincident and confounding effects of numerous short-term and long-term changes in society. These changes and their effects on the future of working life are even more problematic and difficult to understand for youth than for the work force in general.

1.1.1 Changes in Environments Accelerate Competition

The most significant foreseeable factor to affect occupational structures and career choices is the high average age of the workforce in Finland and the changes this implies for the demographics of the workforce over the next decade. The working age population in Finland will start to decrease when the post-war 'baby boom' reaches retirement age. This decrease will be most rapid in the early 2010s, when approximately 10,000 more people per year will leave the workforce each year due to retirement than join it from the young age groups. This will create new job opportunities in almost every occupational sector. A Working Group Report from the Finnish Ministry of Labour has projected the number of new job openings as a result of workplace changes and work force reductions. According to a basic path calculation, approximately 900,000 new jobs will become available, according to a target path calculation there will be 1,100,000 and according to an employment growth path calculation there will 1,000,000 jobs opening up in the years 2000-2015. Problems with the availability of labor resulting from the high demand will be unevenly distributed across various sectors. (Työministeriö 2003a.)

The structure of and demand for a skilled workforce depends on regional production structure and the problem will be largest in some occupational sectors in the labor market. This predictable trend will only exacerbate problems that are already being experienced as a result of decreasing student enrolment in some vocational upper secondary education and training programs. Machinery and metal technology, technology and transport, construction technology and surface treatment technology are fields that already have problems with inadequate enrolment and may experience even greater challenges as employment opportunities increase and competition between programs for new students grows as a result. (Opetusministeriö 245/430/2002.) In fact, these problems are already evident and seem to be increasing. The circumstances of the machinery and metal technology sector of vocational upper secondary education and training in the Lahti Region is presented in detail in Chapter 2.

Vocational institutions compete for students not only with each other but also with general upper secondary schools. The problem of the status of vocational edu-

cation in Finland is not new. Honka (1988, 101) has previously reported that the development activities that have been carried out in Finland are not adequate. He claimed that in spite of the renewed education system vocational upper secondary education has not become a sufficiently attractive option for students compared to general upper secondary education, with the result that many vocational institutions have a significant shortage of students. Honka also claimed that personnel in vocational institutions are not actively promoting changes that would improve this situation.

Although the approaching labor shortage was already predicted in 1988 and earlier, the problem was generally ignored. It was only ten years later that the Vocational Education Act (630/1998) and the Vocational Education Decree (811/1998) promoted the status of vocational education by making students who graduate from upper secondary vocational education eligible for further studies.

National education development plans announced by the Ministry of Education in its Development Plan 1999-2004 include actions to improve the status of upper secondary vocational education (Opetusministeriö 2000). "Development of vocational education and training is a topical and important task. Education and training supply will especially be increased in fields of particular relevance to the national economy and in fields suffering from labour shortages." (Ibid.)

In 2003, the Finnish Ministry of Education began to support activities that will have a positive effect on the attractiveness of problematic education sectors. These included the following: redirecting the provision of education and training, student recruitment, cooperation between education and working life, purchase of machinery, support of the students and their motivation, upgrading workplaces and social places at schools, upgrading work safety and supporting teachers' and students' on-the-job learning. (Opetusministeriö 245/430/2002.) The intent is not only to upgrade the infrastructure in institutions but also to promote cooperation between educational institutions and industry. The effectiveness of these initiatives will first be evaluated in the autumn of 2004.

In Development Plan 2003-2008 (Opetusministeriö 2004a) the supply of and demand for education and labor received continued attention. To bring supply in line with demand, developmental activities have been undertaken to provide career guidance for students during educational transition phases and to strengthen cooperation between education providers in order to ensure opportunities for students' to pursue their individual educational choices. These activities respond to changes in the behaviour of young students. As stated earlier, the focus of previous development activities was more on upgrading the infrastructure of institutions. Lähteenmaa and Siurala (1991, 21), however, emphasize the importance of fundamental changes in the context of career choices. "The transition from studies to the world-of-work is becoming a diverse process in which the rationally structured transition from collective systems of education and career counselling to the world-of-work is but a memory from the past."

Not only educational institutions, but also companies, employee organizations and employer associations have cooperated to contribute to the common goal of improving the attractiveness of vocational education and training. Over last decade young people have been encouraged by several marketing campaigns to seek their

occupation and education within industry. Several national and local campaigns and projects have also been launched in the machinery and metal technology field. Despite these activities, the attractiveness index for machinery and metal technology is decreasing in the Lahti Region. In the year 2000, the attractiveness index, which is defined as the ratio between primary applicants and available seats in a program, was 0,69, which is considered very poor. By 2004 the attractiveness index had fallen to 0,41. However, the index varies among vocational institutions. The index was at its highest at 0,89 for the Orimattila Institute in 2003, and at its lowest at 0,20 for the Heinola Institute in 2004. Supply and demand will be in balance when it is 1.

The lack of attractiveness of vocational upper secondary education and training is not only a Finnish problem. Bainbridge & Murray (2000, 88) list actions that other EU Member States have carried out or are planning to carry out in order to reform their vocational education systems. Career choices, career paths and the attractiveness of vocational education are a prime focus of these reforms:

a. providing more vocational guidance in schools and colleges so that young people are better informed about career and related educational and training options open to them;

b. increasing apprenticeships and traineeships;

c. making it easier for people to switch from a vocational education or training programme to a general or more academic one;

d. establishing a more coherent system of certification of competence at various levels;

e. raising the esteem attached to vocational in relation to academic qualifications to encourage more young people to opt for this career path and thus helping to ensure that more people pursue the option most suited to their capabilities and fewer drop out;

f. improving the quality of vocational education and training programs, to make them more attractive to students and more valuable in terms of their career choices, in particular, by strengthening the workplace element in some cases and the theoretical content in others. *(Bainbridge & Murray 2000, 88.)*

Similar reforms are included in Development Plans prepared by Ministry of Education in Finland (Opetusministeriö 2000; 2004a). However, because both individual behaviour and the context are changing continuously, this development work is problematic and the core reforms proposed by Bainbridge and Murray (2000) require ongoing critical examination and revision. For example the reform c. making it easier for people to switch from a vocational education or training programme to a general or more academic one, should also be considered conversely. Is it possible to make it easier for students to switch from general training programs to vocational training programs?

The various interest groups sometimes have opposing viewpoints about the attractiveness of vocational education and training, which further complicates the development work. Some interest groups point out that companies in the business sector are the essential opinion leaders and that outdated mental images of dark workplaces and dirty jobs push young people away from industrial work. In particular, the image of industrial work as assembly line work with little social contact and no challenge does not attract young people (Yli-Erkkilä 2002). Others feel that the core problem lies with basic general education, and especially the teachers' and career counsellors' attitudes and unawareness of working life that direct students towards general upper secondary education and universities. One reason given for this is that teachers and career counsellors are academically educated and that they seldom have any personal experience or contacts with industry.

Other educational sectors together with machinery and metal technology are also suffering from a lack of attractiveness to students. Juslin (2002) points out the attractiveness of education is a challenge for the whole forestry sector, which will stand or fall on the basis of a skilled workforce. In the case of forestry, according to Juslin, attractiveness is more in the hands of employers than education providers.

Thus, competition for students exists not only between general upper secondary schools and vocational institutions but also between various educational sectors and fields in vocational upper secondary education and training. According to Kurtelius (2002, 110) the focal questions for the operation of educational institutions at present are: "How to get enough students? How to get them to remain? How to help them to complete their education within a given time with qualifications? How to ensure that they find employment?" These questions are also fundamental in this research.

Young students have many options to consider when choosing an educational program. They make their choice of education, occupation and work in a world of increasingly complex and ambivalent information. Stenström (1993, 40) asserts that today the choice of occupation and job is made individually as compared to the past when choices were made according to social norms.

Social norms, lifestyle, values and attitudes are sociological factors whose trends are difficult to anticipate or even to recognize quickly, and yet they affect human behaviour significantly. These changes then have a direct affect on education and occupations. (Brown 2003, 385.) Thus, educational and sociological changes are closely tied and one change can accelerate the other. Maljojoki (1991, 23) presents a comprehensive theoretical framework, which indicates that the structures and systems of society may affect young people differently in different times and that changes in economic, cultural and social environments and changes in students' own educational definitions, independently and jointly, may cause changes in the structures and systems of society.

1.1.2 Supply and Demand do not Meet

Technological development in an industrial sector generally leads to an increase in productivity, which in turn causes a decrease in employment. The metal industry,

however, is an exception. Despite ongoing innovation, 54,050 new jobs are anticipated in the metal and machinery sector by 2010. (Autio et al. 1999.) There are projected to be 25,850 new metal workers required, primarily due to retirements, and 28,200 new mechanics, with growth being more important than retirement.

Raising the status of occupational skills and increasing the attractiveness of vocational education are prerequisites to increasing student enrolment in training programs and thus ensuring a sufficient labor force in industry. The enrolment target for the year 2008 in general upper secondary education is 41,000 students and in vocational upper secondary education and training the target is 60,700 students. Amongst the latter, 20,700 will be in technology and transport. (Opetusministeriö 2004a.) This means that 60% of young students are projected to continue their studies in vocational upper secondary education and 34% of these will be in the technology and transport sector.

In the Lahti Region, machinery and metal technology is a significant part of the regional production and labor market. The industrial sector in the Lahti Region will employ 16,960 people in 2010, which is 65.2% of the entire labor force. The metal sector will employ 18.5% of the labor force in 2010, which amounts to 4,813 employees. (Saikkonen et al.2003, 74-75.) A more detailed review of this forecast is presented in Chapter 2.

In 2004 the number of students entering general upper secondary education in the Lahti Region was 1,397 and in vocational upper secondary education it was 1,449. The number of study places in technology and transport was 602 and in machinery and metal technology the student intake was 126. (Alanko et al. 2004.) This means that 51% of young students in the region have the opportunity to continue their studies in vocational upper secondary education and training and 42% of those can enter technology and transport programs. 21% of the students in technology and transport have the opportunity to study machinery and metal technology. This means that in total 4.4% of the young people studying in upper secondary vocational education has the opportunity to study machinery and metal technology in the Lahti Region.

According to forecasts of workforce and education needs in the Lahti Region (Saikkonen et al. 2003, 50) the need for study places in 2010 will be between 1,096 and 1,549 in the technology and transport sector. The required increase in the number of study places from the 602 available in 2004 (Alanko et al. 2004) is, therefore, between 494 and 947. The forecast are goal-oriented, and the number study places will not presumably be as voluminous as is anticipated, but the need for study places will undoubtedly increase.

One of the greatest challenges facing companies in the metal sector is the recruitment of a skilled workforce (Saikkonen et al. 2003). Forecasts suggest that in order to meet this challenge it is imperative that the sector improve its image and attractiveness. They also indicate that increasingly young people are looking further afield and that consequently competition for workers is now occurring on a European level. (Ibid. 20.)

The transition to a European wide labor market has not been considered in this research, which concentrates on examining regional labor market and student flows. The effect of international education and career opportunities on the educa-

tional choices of young students should be examined. Altough, at present vocational institutions aim to provide a workforce mainly for the needs of regional economic life. Students come primarily from the Lahti Region. 86.4% of the applicants to vehicle and transportation sector programs in Lahti Region vocational institutions are from the Lahti Region and 11.1% are from neighbouring provinces. (Saikkonen et al. 2003, 55.)

There are also other factors affecting employment and training patterns. Ahlqvist (2003a), for example, points out that the relative number of blue collar industrial workers can be expected to decrease when future technological developments are considered. According to Ahlqvist, key technologies in the future will be information and communication, biotechnology, and material and nanotechnology. Some of the new professions expected to experience growth in the future are bio-informationist, artificial intelligence consultant, nano-technology consultant and visualization specialist.

Still, the expansion of new technologies will take time. Although the Häme Region Technology Strategy (Hämeen alueellinen teknologiastrategia 2003) emphasizes the importance of technology for regional development, its focus is still on the primary traditional business sectors of the region. The strategy sets objectives for educational institutions to ensure the availability of a skilled workforce in machinery and metal technology.

Lack of a skilled workforce can lead to a lack of workplaces and, at its worst, to a loss of business to other countries. A skilled workforce is essential to the region. Raunio (2001) emphasizes the significance of human resources as the primary source of competitiveness for urban districts. Thus, urban districts must provide structures for human resource development in every phase of the lifespan. Raunio emphasizes that competence attracts competence. Vocational institutions play an important role in the development of regional competitiveness and competence. Innovation work and learning in companies can be promoted by vocational education. (Opetusministeriö 2003.) As a result, educational institutions have assumed an increasing role in local and regional development activities.

Economic changes that affect the workforce and occupations are part of large-scale long-term trends in the labor market of the expanded European Union. In Finland, for example, the 'China phenomenon,' (i.e., the migration of industrial workplaces to China) has both long-term and short-term economic consequences. Thus, national and regional policies affect the willingness and ability of companies to invest in people and structures.

The Finnish Ministry of Finance has proposed a comprehensive strategy for the education system and vocational education in the report Challenges for Growth in the 21st Century (Sovala et al. 2004). The report focuses on the question: How will Finland cope with the ageing of its population when labor supply will start to decline and international competition is still increasing? The report states that policies for growth in the 21st century depend on increasing the employment rate, accelerating productivity growth and making the public sector more efficient. In spite of the well-functioning Finnish educational system, there is still room for efficiency gains. The report suggests that vocational institutions and the education sector in general have not adapted fully to changes in business life and population structure.

Sovala et al. (Ibid. 62) emphasize that while the present clearinghouse system successfully channels students to institutions, it does not sufficiently encourage the development of education and training according to the requirements of working life. As a solution to this, the report suggests the integration of general and vocational upper secondary qualifications. This has been proposed as a solution to the problem of the status of vocational education previously however with no noticeable results. Instead of integration, the Ministry of Education (Opetusministeriö 2004a) instructs educational institutions and education providers to cooperate with each other and with working life to develop better correspondence between supply and demand in vocational education.

As a result of changes in working life and individual behaviour, the attractiveness of educational fields and occupations is becoming increasingly important and at the same time increasingly ambivalent. Students attach increasing importance to finding an interesting job, which means that individual preferences are emphasized in the career choices and educational pathways of young students (Maljojoki 1991; Tuohinen & Vuorinen 1991). Educational choices of students must, however, also meet the demands of the labor market. As Hamm (1998) aptly puts it, "Subjectivity must align with collectivity."

The choice is not easy. In Finland the we have nine sectors of education with seventy-one educational fields in different educational levels (Opetusministeriö 2004c).

1.2 Research Problem and Research Design

The issues being examined in this research affect various local, regional and national stakeholder groups, both in business and education sectors. The attractiveness of an education sector and career derives in most cases from the whole field and all education levels from vocational upper secondary education and training to polytechnics and university level education. The problem of attractiveness of vocational education is also global. This research concentrates, however, on vocational upper secondary education and training for machinery and metal technology in the Lahti Region.

Lent, Brown and Hackett (1994) have constructed a model of the personal, contextual and experimental factors that affect career-related choice behaviour, which employs a framework of social cognitive career theory. The model, which is introduced in more detail in Chapter 3, assumes that the interests, self-efficacy and outcome expectations of an individual affect his/her goals for engaging in activities and choosing a career. Contextual influences affect and moderate choices and actions throughout the whole lifespan. Contexts (e.g., general and vocational educational institutions, the labor market, family circumstances) provide opportunities, challenges, and constraints to individuals along their career pathways. (Kirkpatrick Johnson & Mortimer 2002.)

Maljojoki (1991, 23) points out that in research on young persons the essential question is: What is the interaction between the young and the environment and

how do young people define the other issues and occasions in their life? This research focuses on the interests of an education seeker and the contextual factors that affect educational and career choices and career development.

The main research question and sub-questions in this dissertation are:

Main Research Question: What model would represent the relationship between and inter-play of the elements and factors of attractiveness in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology?

Sub-Question #1: What are the elements and factors of attractiveness to students of vocational upper secondary education and training in machinery and metal technology?

Sub-Question #2: What factors are most important in contributing to or detracting from the attractiveness to students of vocational upper secondary education and training in machinery and metal technology?

In this research elements are the general categories, which contain specific factors that contribute to or detract from attractiveness.

The research design is presented in Table 1. The purpose of this research is to develop and present new understandings of locally, regionally and nationally significant real-life problem of improving the attractiveness of vocational upper secondary education and training. Key theories that comprise the theoretical framework for the research are career choice and development theories as well as interest theories. The research strategy is a constructive case study, and both qualitative and quantitative research methods are used in methodological and data triangulation.

Table 1. *Research Design*

Research Purpose	Research Phenomenon	Key Theories	Research Strategy	Research Methodology
To develop and present new understandings of the locally, regionally and nationally significant real-life problem of improving the attractiveness of vocational upper secondary education and training.	The influence of contextual factors on the interest of the education seeker in career choice and development.	Career choice and development theories. Interest theories	Constructive case study.	Methodological and data triangulation. Qualitative and quantitative Research methods.
Chapter 1	*Chapter 3*	*Chapter 3*	*Chapter 4*	*Chapter 4*

The bottom line in Table 1 identifies the chapter where the topic is discussed. *Chapter 1* discusses the research purpose, *Chapter 3* presents the theoretical background of the research and *Chapter 4* presents the research methodology.

The other chapters in the dissertation are as follows: *Chapter 2* discusses the research context in detail and represents the status of machinery and metal sector in education and labor market. *Chapter 5* describes the implementation of the research, collection and analysis of research data and the quality of the research. Results are presented in *Chapter 6* and *Chapter 8* provides the summary of the research, discussion of the results and recommendations to practitioners and researchers. *Chapter 7* discusses the evaluation of the quality of the research.

2 RESEARCH POPULATION AND CONTEXT

2.1 Stakeholders and Context Levels of Attractiveness

2.1.1 Key Stakeholders and Context Levels

Many people, institutions and processes affect the attractiveness of vocational education and training. The various key stakeholders can be categorized as local (public sector and private sector), regional, national or international (Kotler et al. 1999). These categories are described in Table 2.

The immediate focus of this research is on local and regional stakeholders, each of which is the specific subject of research data collection. Members of either group may be from the private or the public sector, including such examples as educational institutions, companies and students and their social networks. The national stakeholders are the National Board of Education, the Ministry of Education, the Ministry of Labour, and the national associations of employer and employee organizations. The regulations and viewpoints of national stakeholders are considered by studying their acts, development plans and research reports.

The various stakeholders can be examined at several context levels. Context includes many dynamic social, cultural, economic, and personal variables that are interdependent with one another (Chen 2003, 6). Context can be defined as a complex whole, which consists of many interrelated and interwoven parts (Young et al. 2002, 207).

In educational and sociological research, the term ‘macrolevel’ is often used to describe the system and structure level, ‘mesolevel’ is used to describe the institutional level comprised of professional associations, and ‘microlevel’ is used to describe the individual training consumers and providers (Koch & Reuling 1998; Zinn 2002). A distinction can also be made between the ‘social’ level and ‘individual’ level. When using this distinction, the family, peers, school and youth culture act as mediating stakeholders. (Jokinen 1988.) Kasurinen (1999) divides the context in her study into two systems: the ‘microsystem’ (family, peers and schools) and the ‘macrosystem’ (opportunity structures of the society). In an OECD report on career guidance and public policy (2004) the effects of career guidance were examined at the societal level, the organizational level and the individual level. Rauhala (1994, 64) has studied the flexible education structures experiment in Finland. He defines development work in terms of individual actions on microlevel and the development objectives established on the macrolevel, which are the basis

for those individual actions. Näsi (2002, 31) included an additional level to his study of the business world: the 'megalevel,' which refers to globalization as an observation level.

Table 2. *Key Stakeholders in the Field of Educational Attractiveness (adapting Kotler et al. 1999, 67)*

Stakeholder group	Stakeholder
Local stakeholders	• Lahti Region Educational Consortium • Salpaus Further Education (Vocational Institutes) • Comprehensive schools • General Upper secondary schools • Companies • Media (newspaper, radio, TV, Internet) • Students • Families • Peers
Regional stakeholders	• Lahti Region Educational Consortium • Salpaus Further Education • Finnish Metalworkers' Union • Technology Industries of Finland • Lahti Chamber of Commerce • Lahti Region Business Center Ltd. • Confederation of Finnish Industry and Employers • Media (newspaper, radio, TV, Internet)
National stakeholders	• National Board of Education • Ministry of Education • Ministry of Labour • Ministry of Finance • Finnish Metalworkers' Union • Technology Industries of Finland • Confederation of Finnish Industry and Employers • Media (newspaper, radio, TV, Internet)

In this research, attractiveness is considered from the macrolevel, institutional level and microlevel. The macrolevel is comprised of systems, structures and national level stakeholders; the institutional level is comprised of organizations, institutions, local and regional stakeholders; and the microlevel is comprised of individuals and their peers and relatives, all of whom are in the private sector. Each level is partially dependent on and partially independent of the whole of which it is a part (Patton & McMahon 1999, 143). The megalevel has been omitted from this research because the international stakeholders are not yet significant. However, it is clear that in the near future educational research must begin to include the effects of internalization because there will be important implications for educational practice.

2.1.2 Autobiographical Statement

In this research also the researcher is a stakeholder. In qualitative research, it is essential to outline for the reader the researcher's interests in, contributions to and experience of the research topic so that the influence on the research of his or her personal perspective and intentions can be understood. The following autobiographical statement provides such background information.

According to Brown (2003, 20), career development is a complex "lifelong process involving psychological, sociological, economic, and cultural factors that influence individuals' selection of, adjustment to, and advancement in the occupations that collectively make up their careers." My career development process is still ongoing. It has involved innumerable factors, influences and learning opportunities. In this autobiographical statement I am able to present only a few issues that I consider to have particular significance for this research. I have omitted information about my childhood and youth, and also my current private life as a mother of three. However, I do not dismiss the significance of the impact of these factors on my personality, values, opportunities and choices.

The explicit aspects of my career development process started after graduation, when I took my bachelor's degree in telecommunications engineering technology. Subsequently I received vocational teacher qualifications through a vocational teacher education college and a Master's degree in Education from the University of Tampere.

In addition to my professional training and career involvement in technology, particularly digital logics, I have always been interested in teaching, consulting and management, which I have studied extensively through various education programs concurrent with my employment. These programs included topics such as consulting for educational institutions, quality management in learning organisations and development of on-the-job training. I have also completed studies in professional development for education, and taken a specialist qualification in management and a certificate in educational administration.

After receiving my bachelor's degree I worked as an adult educator in the field of electronics in an adult education centre. My career as an educator has taught me to be both modest and enthusiastic in the face of new issues and to be delighted by any advance of the students and myself. In this work cooperation with local companies was continuous, obligatory and successful.

In the late 90's I began my career as a project manager at the University of Tampere, Research Centre for Vocational Education. The project was a further education and training program for vocational teachers and the objective was to improve cooperation between education and the world-of-work. 190 teachers from vocational upper secondary institutes participated in the program and carried out over twenty specific individual projects with companies.

For the past six years I have worked as a project manager in human resources development projects for industrial companies. The projects in which I have been involved were mainly financed by the European Social Fund. The Lahti Region Educational Consortium has been responsible for their administration. In addition, I have planned projects and training programs concerned with anticipation of the

qualitative and quantitative needs for vocational education and training in the region.

Currently I work as a development manager for Lahti Polytechnic, which is an independent business unit of the Lahti Region Educational Consortium, with responsibility for the development of teacher education and post-graduate studies in the consortium.

Together with my primary work I have been privileged to work on international projects in affiliation with local and national stakeholders in Lithuania, Latvia and Russia. The focus has been on consulting services for vocational upper secondary educational institutes to assist them with anticipation of training needs, human resources development and quality management. The most challenging and rewarding work has been in human resources development for the Russian Federal Nuclear Center and a project to develop pilot regional education and examination centres in Lithuania.

My career and further studies have given me the opportunity to write articles and reports for publication on topics such as cooperation between education and the world-of-work, on-the-job training and human resources development.

I have always been an observer. By this I do not mean to imply passivity or distance, but rather active reflection on and interpretation of my context and experience. I believe that proactive actions best fulfil planned objectives and provide an important opportunity for constructive and intentional change for the individual and the organization.

Interest in the topic of this study arises from observation of the ongoing debate in the media, educational institutions and companies, which first came to my attention when I worked with metal industry and other industrial companies in the Lahti Region on human resources development projects. I was able to consider the problem from a distance, as an interested and involved party but not as a key stakeholder of the problem.

Throughout the entire research process I have had the benefit of the opportunity for direct discussions with various stakeholders. As Blumer (1969, 38) points out the "empirical social world consists of ongoing group life and one has to get close to this life to know what is going on in it." I place myself in the middle of the field on the institutional observation level, which has given me the opportunity for close relationships with both companies and vocational upper secondary institutes and their personnel.

Educational organizations and labor market organizations plan and implement separately, or occasionally together, systems to balance the supply and demand for educational programs and skilled graduates in various areas. Meanwhile, the individual is making his or her own educational and career decisions independently. Currently we have only limited knowledge about how to link these complicated multilateral processes in a way that it will be successful for all the stakeholders.

It is difficult to know how best to improve this complex situation, but I believe that the first bits and solutions can always be found. Through continuous research and practice we can achieve deeper and wider understanding, and we can learn to be more proactive in our development work.

My professional interests and goals for the future are to continue research and development work in vocational education and human resources. I am interested in challenging but resolvable real-life assignments, which is what the topic of this research has proven to be.

2.2 Vocational Upper Secondary Education and Training

2.2.1 Vocational Upper Secondary Education and Training In Finland

Vocational education and training in Finland is governed by the Vocational Education Act (630/1998) and Vocational Education Decree (811/1998). The education provider must have a license granted by the Ministry of Education to be entitled to award vocational qualifications. This education provision license determines such things as the fields of study, total number of students and the provider's educational duties.

The Vocational Education Act describes the objectives of vocational upper secondary education and training as follows:

> "The objective of vocational upper secondary education and training is to provide students with the knowledge and skills necessary for acquiring vocational expertise and with capabilities for self-employment. The further objectives of the education are to promote the students' development into good and balanced individuals and members of society, to provide students with the knowledge and skills necessary in further studies, personal interests and the versatile development of personality, and to promote lifelong learning." *(Vocational Education Act 630/1998)*

The scope of the study program in upper secondary vocational education and training is 120 credits, one credit being equivalent to an average study time of 40 hours. The study program includes 90 credits for vocational studies and relevant on-the-job training, 20 credits for common studies and 10 credits for free-choice studies of individual students.

The joint application systems are national procedures that Finnish educational institutions use when selecting new students to general upper secondary schools, vocational institutes, some folk high schools and polytechnics. This means that a student can apply for admission to several different schools, by filling in only one application form. There are two separate systems for joint application: the joint application system to general upper secondary schools, vocational institutes and some folk high schools and the joint application system to polytechnics. The application dates are in February for programs beginning in the autumn and in September for programs beginning in January. (National Board of Education 2004.)

In the selection of students for vocational upper secondary training, points are awarded for general academic success and for success in the most relevant subjects, for work experience, for results in the entrance examination or aptitude test (if any)

and for gender. In male or female dominated fields, points are given for the minority gender. Young people without previous vocational education are given particular priority in the selection. The aim is to give each applicant an equal opportunity to obtain at least one vocational degree. (Ibid.)

The Finnish education system is represented diagrammatically in Figure 1. The Vocational Education Act 630/1998 extended eligibility for further studies to students who had graduated from vocational upper secondary education and training. The possible study pathways are illustrated as arrows from on education level to the other level in the education system chart.

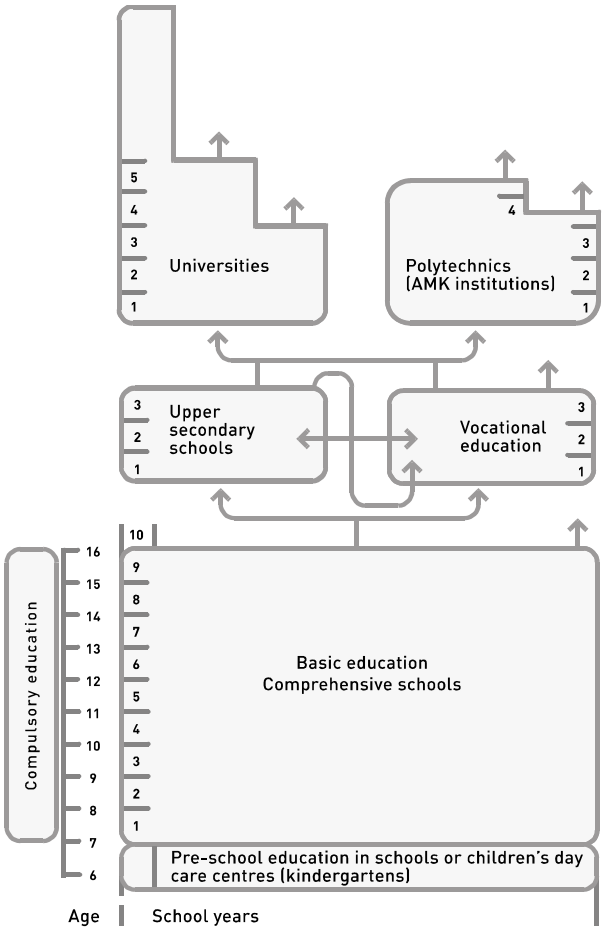

Figure 1. *The Finnish Education System Chart (Opetushallitus 2002)*

Although all the pathways are possible, they are not equally probable. The first agreement to give the students the opportunity to bring polytechnic level studies into the study programs of vocational upper secondary qualifications and thereby shorten the program was made in autumn 2004 when the educational institutes in the Lahti Region signed a cooperation agreement on the assignment of study credits (Puitesopimus 2004).

2.2.2 Vocational Upper Secondary Education and Training in the Lahti Region

Salpaus Further Education is an independent business unit in the Lahti Region Educational Consortium. It serves as an organizer of education on behalf of the consortium. The Lahti Region Educational Consortium also provides polytechnic education.

Table 3. *Educational Sectors and Number of Students in Each Institute of Salpaus Further Education in January 2004 (Salpaus 2004)*

Institute	Educational Sectors	Number of Students
Heinola Institute	business and administration culture tourism, catering and home economics technology and transport	549
Lahti Vocational Institute	technology and transport	933
Lahti College of Business Studies	business and administration	646
Lahti College of Arts And Crafts	culture	603
Lahti College of Hospitality	tourism, catering and home economics	560
Lahti College of Social Welfare And Health Care	health care and social services	586
Nastopoli Upper Secondary School	general upper secondary education	223
Nastopoli Institute	technology and transport	190
Orimattila Institute	music leisure and physical education health care and social services tourism, catering and home economics technology and transport	284
Päijänne Institute	natural resources	290
Apprenticeship Training	all education sectors in Salpaus Further Education	1,385
Total for all programs		6,249

Salpaus Further Education arranges vocational and general upper secondary education and training for comprehensive school leavers and adults together with

training, development and related services for businesses and organizations. It comprises almost all the vocational colleges in the Lahti Region as well as one general upper secondary school. The training programs it provides are business and administration; culture; music; natural resources; tourism, catering and home economics; health and social services; technology and transport; leisure and physical education. (Salpaus 2004.)

According to statistics for January 2004 (Ibid.) the number of students in Salpaus Further Education was 6,249 students, 4,641 of whom were in vocational upper secondary education and training, 223 of whom were in general upper secondary education and 1,385 of whom were in apprenticeship training. The number of students in each institute of Salpaus Further Education in January 2004 is presented in Table 3. The institutions that are located in the city of Lahti arrange education primarily in one education sector and the institutes in neighboring municipalities (Heinola and Orimattila) arrange education in several education sectors.

The home municipalities of the students in vocational upper secondary education (4,641) are divided as follows: from the member municipalities (14 municipalities) of the Lahti Region Educational Consortium 3,748 students (81%), from other municipalities in Finland 793 students (17%) and from abroad 100 students (2%) (Salpaus 2004). Thus, most of the students attend the vocational institutions in their home municipalities.

2.2.3 Student Flows in the Lahti Region

The distribution of applications to secondary education submitted by 9th grade students from comprehensive schools in Finland and in the Lahti Region in 2002 are presented in Table 4 (Tilastokeskus 2004a). The rate of applications to general upper secondary education in the province is lower (54.2%) in Finland generally (58.2%). Male students in the Lahti Region apply to vocational upper secondary education and training more often (50.7%) than female students (34.5%). Application to education varies regionally. For example, in the region of Uusimaa 66.8% of the students applied to general upper secondary education and in the region of Kymenlaakso the corresponding number was 51.1%. The variation is probably due to the diverse economic structure, population base and educational opportunities in the regions.

Three institutes of Salpaus Further Education: Heinola Institute, Orimattila Institute and Lahti Vocational Institute offer education in the field of machinery and metal technology. In the Lahti Region in 2002, 948 students from comprehensive schools applied to vocational upper secondary education. The tendencies of students applying to machinery and metal technology are presented in Tables 5 and 6. The tables represent the number of primary applicants into the machinery and metal technology field (Table 5) and the number of study places in the corresponding field for each institute in Salpaus Further Education (Table 6). Data is presented for the years 2000, 2001, 2002, 2003 and 2004.

Table 4. *Application to Secondary Education of the 9th Grade Students in Comprehensive Schools in 2002 in Lahti Region and Finland (Tilastokeskus 2004a)*

	Students Graduated From Comprehensive School in 2002	Application to General Upper Secondary Education	Application to Vocational Upper Secondary Education and Training	No Application in Joint-application
		%	%	%
Finland	61,477	58.2	39.2	2.6
Lahti Region Total	2,221	54.2	42.7	3.2
Lahti Region Male	1,121	47.0	50.7	2.3
Lahti Region Female	1,100	61.5	34.5	4.0

Attractiveness index is defined as the ratio between primary applicants and available study places. Attractiveness is poor when the ratio is lower than 1. The measure of attractiveness index is employed here, because the measure of occupancy rate contains also those students who have started their studies in the education field and the field might have been on the second to fifth position on their education preferences list. Occupancy rate is defined as the ratio between study places and the students that have started their studies in the educational field. The veracity of the both measures is based on the official statistics of the National Board of Education and Statistics Finland. Table 7 presents the attractiveness index for each institute that offers education in machinery and metal technology.

The numbers in Table 5 also include primary applicant students with special needs. The number of special group students who applied to education in Lahti Vocational Institute was 13 in 2003 and 3 in 2004. The number of study places for students with special needs was 10 in each year. These are also included in the numbers of available study places.

Table 5. *Number of Primary Applicants to Machinery and Metal Technology in 2000-2004 (Institute Statistics 2004)*

Primary Applicants to Machinery and Metal Technology Program (Male/Female)	2000		2001		2002		2003		2004	
	M	F	M	F	M	F	M	F	M	F
Lahti Vocational Institute	50	0	61	1	46	3	43	2	38	2
Heinola Institute	16	0	11	0	15	0	12	0	4	0
Orimattila Institute	9	0	13	1	10	0	16	0	8	0
Total	75	0	85	2	71	3	71	2	50	2

Table 6. *Number of Study Places in Machinery and Metal Technology in 2000-2004 (Institute Statistics 2004)*

Study Places in Machinery and Metal Technology Program	2000	2001	2002	2003	2004
Lahti Vocational Institute	68	90	70	90	90
Heinola Institute	24	30	40	40	20
Orimattila Institute	16	18	18	18	16
Total	108	138	128	148	126

Table 7. *Attractiveness Index in the Years 2000-2004 in Machinery and Metal Technology*

Attractiveness Index	2000	2001	2002	2003	2004
Lahti Vocational Institute	0.74	0.69	0.70	0.50	0.44
Heinola Institute	0.67	0.37	0.38	0.30	0.20
Orimattila Institute	0.56	0.78	0.56	0.89	0.50
Total Average	0.69	0.63	0.58	0.49	0.41

Table 7 shows that in every institute that provides vocational education in the machinery and metal technology field the attractiveness index is decreasing. The lowest index was for the Heinola Institute (0.20) in 2004. The institute was not able to start a study group in the machinery and metal technology field. Heinola Institute has had remarkably low attractiveness during the last four years, well below 0.50. The attractiveness index has varied from 0.44 to 0.74 in the Lahti Vocational Institute and from 0.50 to 0.89 in the Orimattila Institute. The highest attractiveness index was in the Orimattila Institute in 2003 (0.89), which is exceptionally high.

In Table 8 the study places and primary applicants as well as attractiveness indexes are presented for the vocational institutions studied in 2003 when the data for this research was collected. The attractiveness index is under 0.5 in hotel and catering field (0.47) and under 1.0 in electrical engineering (0.83). The highest attractiveness index was for the youth and leisure instruction field, which is remarkably high at 2.7.

The educational fields of heating, plumbing and ventilation; health care and social services and motor vehicles and transport have quite high attractiveness indexes ranging from 1.10 to 1.44.

Table 8. *Number of Study Places and Primary Applicants in 2003 for Institutions in this Research (Institute Statistics 2004)*

Institute/Sector	Number of Primary Applicants (Male/Female) 2003		Study Places 2003	Attractiveness Index 2003
	M	F		
Lahti Vocational Institute				
Heating, plumbing and ventilation	45	1	32	1.44
Lahti College of Social Welfare and Health Care				
Health care and social services	24	141	119	1.39
Heinola Institute				
Motor vehicles and transport	22	0	20	1.10
Hotel and catering	6	22	60	0.47
Orimattila Institute				
Electrical engineering	14	1	18	0.83
Youth and leisure instruction	16	38	20	2.70

However, the number of students that actually began their studies in 2003 was higher than the number of primary applicants. The total intake consists of primary applicants, secondary applicants and even students who have rated the educational field as their fifth choice on the application forms.

2.3 Supply and Demand for Workforce and Education in the Metal Sector

Finnish industry gave employment to 475,000 people in 2001. Forty-five percent of those employed worked in metal, engineering and electro-technical industries (Statistics 2001). The number of students who graduated from vocational upper secondary level education and training in the years 2000 - 2010 in the machinery and metal technology field is approximately two thirds of the predicted future demand. This shortfall is understood to result from the limited number of the study places, the lack of attractiveness of education and in relatively large number of students who do not complete their training program. (MET 2000, 3.)

The Confederation of Finnish Industry and Employers has stated that from the employers' point of view the attractiveness of vocational upper secondary education and training definitely has to be improved in Finland. Shortages of qualified workers are predictable if current patterns continue and the profile of vocational upper secondary education and training cannot be improved. (Osaamistarveluotain 2002.) The number of workplaces available in Finland for employees who have graduated from vocational upper secondary education is estimated to be 11,200 in the year 2004. Of those, the number of graduates from the technology and transport sector will be 70%; that is. 7,840 employees. (Osaamistarveluotain 2004.)

Industry is the most significant business sector in the Lahti Region (in Finnish Päijät-Häme). Lahti Region comprises 12 municipalities and has a population of 198,000, of whom 98,000 inhabitants live in the City of Lahti. In 2003 there were 82,000 workplaces in the region. (Päijätpuntari 2004.) The industrial sector employed 25,000 persons. The essential industrial sectors are machinery and metal technology, furniture and wooden products. These sectors provided together 50% of the industrial workplaces in the region. The machinery sector employed 20% (5,000 employees) and the basic metal sector employed 8% (2,000 employees) of the workforce. (Lahden kauppakamari 2004.) The numbers include all occupations in the sector.

In the Lahti Region, business tendency surveys for the basic metal industry and machinery sectors are reported separately. Report 2002/1 (Päijätpuntari 2002) shows that since the year 1995 the basic metal industry has increased in the Lahti Region notably faster than in Finland as a whole. The machinery industry has been increasing since the year 2000. There were 247 basic metal industry companies and 214 machinery companies in the Lahti Region in 2001.

A forecast of workforce and education needs in the Lahti Region, differentiated according to occupations, was prepared in 2003 (Saikkonen et al. 2003). Past and future workforce demand in the metal industry is presented in Tables 9 and 10. Industrial work will employ 16,960 people in 2010, which is 65.2% of the whole industrial workforce in the Lahti Region. The metal sector will employ 18.5% of this industrial workforce in 2010, which equals 4,813 employees. According to the forecast, the number of metal workers is increasing, but the percentage will remain at 18.5% of the industrial workforce. (Ibid. 74-75.)

Table 9. *Number of Metal Workers in the Lahti Region According to Occupation Group in Industrial Sector (Saikkonen et al. 2003, 74-75)*

Occupation Group	1995	2000	2005	2010	2015	2020
Metal Work	2,293	2,987	3,470	3,729	3,743	3,958
Assembly Work	1103	889	704	757	760	803
Machinery	474	354	304	327	328	347
Together	3,870	4,230	4,478	4,813	4,831	5,108

Table 10. *Percentage of Metal Workers in the Lahti Region According to Occupation Group in Industrial Sector (Saikkonen et al. 2003, 74-75)*

Occupation Group	1995	2000	2005	2010	2015	2020
Metal Work	11.1	13.1	14.3	14.3	14.3	14.3
Assembly Work	5.4	3.9	2.9	2.9	2.9	2.9
Machinery	2.3	1.6	1.3	1.3	1.3	1.3
Together	18.8	18.6	18.5	18.5	18.5	18.5

An assessment of provincial education needs by the National Board of Education (Opetushallitus 2003, 36) provides forecast figures for the demand for graduates of the machinery and metal technology programs in vocational upper secondary education and polytechnics in the Lahti Region. According to basic path calculations, the demand for new graduates from vocational upper secondary education and training in the machinery and metal technology field will be 1,209 between 2006 and 2015. The education system would have to produce approximately 121 qualified graduates each year during that ten year period in order to meet the predicted need. According to object path calculations the overall need for new employees from vocational upper secondary education and training will be 2,927, which means that 293 qualified graduates must be produced each year. In a third forecast of regional occupations (Saikkonen et al. 2003), the need for new employees is anticipated to be 245 per year, primarily due to retirement. Thus, demand for qualified graduates seems to be between 121 and 293 per year for the next ten years.

In the year 2003, the number of primary applicants to the machinery and metal technology field was 73 students, the number of enrolled students was 93 and the number of study places was 148. Thus 55 study places were unused in the Lahti Region. (Opetushallitus 2004.) If its attractiveness remains low, the machinery and metal technology industry will suffer from significant labor shortages. The gap between supply and anticipated demand continues to widen.

3 THEORETICAL FRAMEWORK

3.1 Career Choice and Development

3.1.1 Theories of Career Choice Development

The attractiveness of education in this research is viewed in the context of career choice and development. Career choice denotes the process of selecting a career (Brown 2003, 7). Career development can be defined as a complex "*lifelong process involving psychological, sociological, economic, and cultural factors that influence individuals' selection of, adjustment to, and advancement in the occupations that collectively make up their careers*" (Brown 2003, 20). Peterson et al. (2002, 314) define the concept of career development as follows: career development is "the implementation of a series of career decisions that constitute an integrated career path throughout the lifespan."

Super (1984, 192) classifies the pioneers in the study of career development into four groups: differential psychologists who were interested in work and occupations, developmental psychologists who were concerned with 'the life course,' sociologists who were interested in occupational mobility as a function of social class, and personality theorists who were interested in the ways that individuals interpret their experience.

Research on educational and career choices and career development has been conducted mainly using sociological or psychological approaches. The focus of psychologically based theories has been on process, traits and development of individuals at various stages of life. Sociologically based theories have focused on the socio-economic status of the family as well as the gender and age of individuals (Brown 2002).

Savolainen (2001, 17) contends that perspectives on educational careers can be distinguished in terms of those that look from 'inside' or 'outside' the career flow of youth. When looking from inside, the definition of career choice is used and when looking from outside, the flow of individuals' career selection is observed.

Patton and McMahon (1999) have examined theories of career choice and development from three system perspectives. The individual system is composed of intrapersonal content influences, including gender, age, self-concept, health, ability, disability, physical attributes, beliefs, personality, interests, values, aptitudes, skills, world of work knowledge, sexual orientation and ethnicity. Social system influences include family, peers, media, community groups, work place and educational institutions. Environmental/societal system influences include political decisions, historical trends, globalization, socio-economic status, the employment market, and

geographic location. (Ibid. 10-11.) Patton and McMahon have also examined process influences on career development, which are: recursiveness, change over time and chance. A more detailed examination of the systems theory approach to career development by Patton and McMahon is presented later in this chapter.

The three systems described by Patton and McMahon parallel the three levels described by Zinn (2002) and OECD (2004). In this comparison, the individual system corresponds to the microlevel, the social system to the institutional level and the environmental societal system to the macrolevel. The latter presentation of context levels is used in this research.

Patton and McMahon (1999) assert that the key elements of career development are individual, environment, interaction and change. The researchers divide career development theories into those that highlight content and to those that highlight process. "Content refers to the influences on career development, such as interests and values, and process refers to accounts of change over time and decision-making processes" (Ibid. 6). These researchers also find that some theories contain both content and process perspectives. A comparison of the major theories of career choice and development according to content influences (intrapersonal system, social system, environmental/societal system) and process influences is represented in Table 11.

Flores et al (2003) arrange career development theories into three main categories. These are: person-environment theories, developmental theories and social cognitive and social learning theories. Among person-environment theories Holland's Typology Theory receives the most attention. Super's Life-Span Theory is an example of developmental theories and the Social Cognitive Career Theory of Lent, Brown and Hackett is the most cited example of social cognitive and social learning theories of career development.

In the comparison by Patton and McMahon (1999) in Table 11, these three aforementioned theories (by Holland, Super and Lent et al.) are categorized into three separate categories. Holland's as a content theory, Super's as a process theory and Lent et al.'s as a combined content and process theory. According to Patton and McMahon, the earlier career theories were restricted to the topic of career decision making and the period of pre- or early adulthood, while more recent theories have extended beyond career entry to include developmental-contextual approaches (Ibid. 82).

Finnish career counselors are mainly familiar with the theories of Holland and Super (Korhonen 1997). Holland (1985) has constructed a widely used Theory of Vocational Personalities and Work Environments, in which the factors affecting career choice are personal factors (e.g., personality traits, self-knowledge, occupational knowledge) and environmental factors (e.g., family and school). Holland's theory describes the career decision maker in terms of six personality types: realistic, investigative, artistic, social, enterprising or conventional. Chen (2003) claims Holland's theory focuses on fitting the person to the environment and that it does not attempt to address the essential aspects of context; that is, the complexity of a context and the various variables interwoven in a context. Super's Life-Span Theory relates the nature, sequence, and determinants of the choices that constitute career over the life span (Super 1984).

Today when rapid changes in workplace, lifetime and globalization demand new theories and practices, the aforementioned career choice and development theories and other major theories show their age (Harris-Bowlsbey 2003; Tang 2003; Savickas 2003). Chen (2003, 6) points out that a flexible, open and holistic approach must be used to examine the wholeness of life career context in the modern era. Theories of career development are in transition, aiming either at theory convergence or integration (Chen 2003; Lent et al. 1994; Patton & McMahon 1999). Modern theories must also be more widely applicable, from the school entry phase to life-long career development. Patton and McMahon (2001) assert that we have to revisit the career decision-making process several times during our lifetime, and that the decision is not restricted to a single event at school exit points. The researcher agrees with Patton and McMahon, but it is appropriate that the decisions do not change repeatedly.

The comparison of career development theories in Table 11 (Patton & McMahon 1999) suggests that the various theories of career development can be divided into interpersonal system theories (e.g., the theories of Holland, Ginzberg, Super) and comprehensive theories that consider the intrapersonal system, the social system and environmental/societal system influences (e.g., the theories of Roe, Krumboltz, Lent et al.). According to the comparison in Table 11, Krumboltz's Social Learning Theory of Career Development is one of the most comprehensive theories. It includes consideration of a wide range of both content and process influences. The Social Cognitive Career Theory by Lent, Brown and Hackett also include a wide range of both content and process influences. The major distinction in the comparison is that Krumboltz's theory includes social system influences (e.g., family, peers, media) that have no significant role in the theory of Lent and associates.

The next section presents three theories of career choice and development that are focal in this research. Each theory includes both individual and contextual factors and influences. These theories are: Systems Theory by Patton and McMahon (1999), Social Cognitive Career Theory by Lent, Brown and Hackett (1994) and Krumboltz's Social Learning Theory of Career Development (1979).

These theories are complementary to each other. Systems Theory describes the system levels and essential factors and stakeholders in career choice and development. Social Cognitive Career Theory emphasizes personal, contextual and experiential factors that affect career interests and career choices. The Social Learning Theory of Career Development defines the process and factors that affect occupational selection. The interrelationships of the theories are illustrated in Figure 5.

Table 11. *Career Development Theories Content Influences and Process Influences (adapted from Patton & McMahon 1999, 32, 55, 76)*

	Theories of Content						Theories of Process			
CONTENT INFLUENCES	Parson	Five-Factor Model	Holland	Dawis & Löfqvist	Bordin	Brown	Ginzberg	Super	Gottfredson	Miller-Tiedeman & Tiedeman
Intrapersonal system										
Ability	■			■						
Aptitudes	■			■						
Interests	■		■	■						
Gender									■	
Age							■	■	■	
Skills				■						
Ethnicity										
Sexual Orientation										
Beliefs										
Health										
Disability										
Values				■	■	■				■
World-of-work knowledge	■		■					■	■	
Personality		■	■	■	■	■				
Self-concept					■			■		■
Physical attributes										
Social System										
Family					■					
Peers										
Community groups										
Education Institutions										
Media										
Workplace				■		■				
Environmental/Societal Systems										
Political decisions										
Historical trends										
Employment market										
Geographical location										
Socioeconomic status									■	
Globalization										
PROCESS INFLUENCES										
Recursiveness				■	■	■				
Change over time				■		■		■	■	■
Chance							■	■	■	■

■ Significant emphasis

Continues

	Theories of Content and Process					
	Krumboltz	Lent, Brown, Hackett	Peterson et al.	Vondracek	Roe	Young, Vallach, Collin
CONTENT INFLUENCES						
Intrapersonal system						
Ability	■	■				
Aptitudes	■				■	
Interests	■	■				
Gender		■			■	
Age	■	■			■	■
Skills	■		■			
Ethnicity						
Sexual Orientation						
Beliefs	■	■				■
Health						
Disability						
Values	■				■	
World-of-work knowledge	■		■			
Personality	■				■	
Self-concept	■	■	■			
Physical attributes	■					
Social System						
Family	■			■	■	
Peers				■	■	
Community groups	■			■		
Education Institutions	■			■		
Media						
Workplace	■			■		
Environmental/Societal Systems						
Political decisions				■		
Historical trends						
Employment market	■	■		■	■	
Geographical location	■					
Socioeconomic status	■	■		■	■	
Globalization						
PROCESS INFLUENCES						
Recursiveness	■	■		■		■
Change over time	■	■		■	■	■
Chance	■				■	

■ Significant emphasis

3.1.2 Extensive Theories of Career Development

Systems Theory Framework of Career Development

Patton and McMahon (1999) conclude that the convergence of career theories started in the beginning of the 1990s. They contribute to this trend by presenting a systems theory approach to career development that incorporates and extends previous work.

The content influences in the framework are two system levels, which are the individual system and the context system. The individual system is composed of intrapersonal content influences, including gender, age, self-concept, health, ability, disability, physical attributes, beliefs, personality, interests, values, aptitudes, skills, world of work knowledge, sexual orientation and ethnicity. The context system contains both social system and environmental/societal elements. Social system influences include family, peers, media, community groups, workplace and educational institutions. Environmental/societal system influences include political decisions, historical trends, globalization, socio-economic status, the employment market, and geographic location. The elements of the individual and context system levels are presented in Figure 2.

Patton and McMahon (Ibid.) consider the process influences in systems theory to represent the multitude of influences on career development. The process influences are: recursiveness, change over time and chance. Recursiveness incorporates key aspects of influences that are nonlinear, acausal, mutual and multidimensional. Recursiveness includes also the relevance of the past, present and future. Change over time describes the nonlinear process of career development, which is in constant movement. Career development is not always logical, planned or predictable. Chance also influences an individual's career choice and development. Chance, being by definition unpredictable, can be referred to as luck, fortune, accident or happenstance.

The researchers outline the key aspects of systems theory to include:

- an emphasis on wholeness and the interrelationship of parts within a whole,
- view of the whole as greater than the sum of its parts,
- the inclusion of elements from a developmental psychology and sociology,
- an emphasis on mutuality of action and interaction; that is, the dynamic and recursive impact of the individual and context of each other. *(Patton & McMahon 1999, 9)*

Figure 2 shows that the characterization of different systems is more detailed on the individual system level than on the social or societal environmental system levels. This may be partly due to earlier career development theories that have concentrated primarily on intrapersonal influences. However, the process of career decision-making does not occur in a vacuum, it is linked to family, social, national and global system (Patton & McMahon 2001).

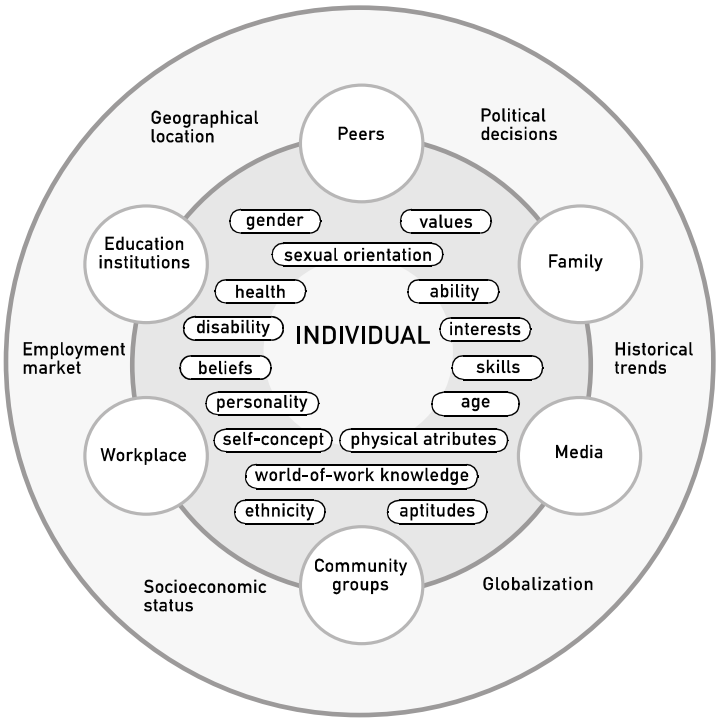

Figure 2. *Elements of the Individual And Context System Levels (Patton & McMahon 1999, 160)*

Patton and McMahon (Ibid. 209) apply the systems theory approach to schools too, by replacing the individual system with the school system. The school's system contains various sub-systems such as students, teachers, school policy, career development facilitator, curriculum and school administration. The representation shows that increasingly closer relationships are required between the various systems and sub-systems to help young students in their career development.

The main advantage to a systems theory of career development is its applicability to macrolevel, institutional level and microlevel analysis. In this research the theory's emphasis on wholeness, inclusion of elements from variety of fields (psychology and sociology) and appreciation of the dynamic impact of the individual and context on each other are the most salient aspects.

Systems theory provides an overall theoretical framework for understanding career development. More detailed consideration of career interests, career choice and career decision making is provided by Lent et al. (1994) in their Social Cognitive Career Theory.

Social Cognitive Career Theory

Social Cognitive Career Theory (Lent et al. 1994) focuses on the interrelation of self-efficacy, expected outcome and goal mechanism with other person, contextual and experiential/learning factors. The theory is derived from Bandura's general social cognitive theory. The Social Cognitive Theory of Career Development contains three interlocking models: a model of interest development, a model of career choice and a model of performance. Patton and McMahon (1999) use Lent et al. as an example of career development theories that recognize both content and process influences. The heart of the theory is its treatment of change over time and decision-making processes.

Figure 3 illustrates the model of person, contextual and experimental factors affecting career-related choice behavior, which is the model of career choice (Ibid. 93). The model of interest development is presented in Chapter 3.2, where interest and interest development in career choice and development is discussed.

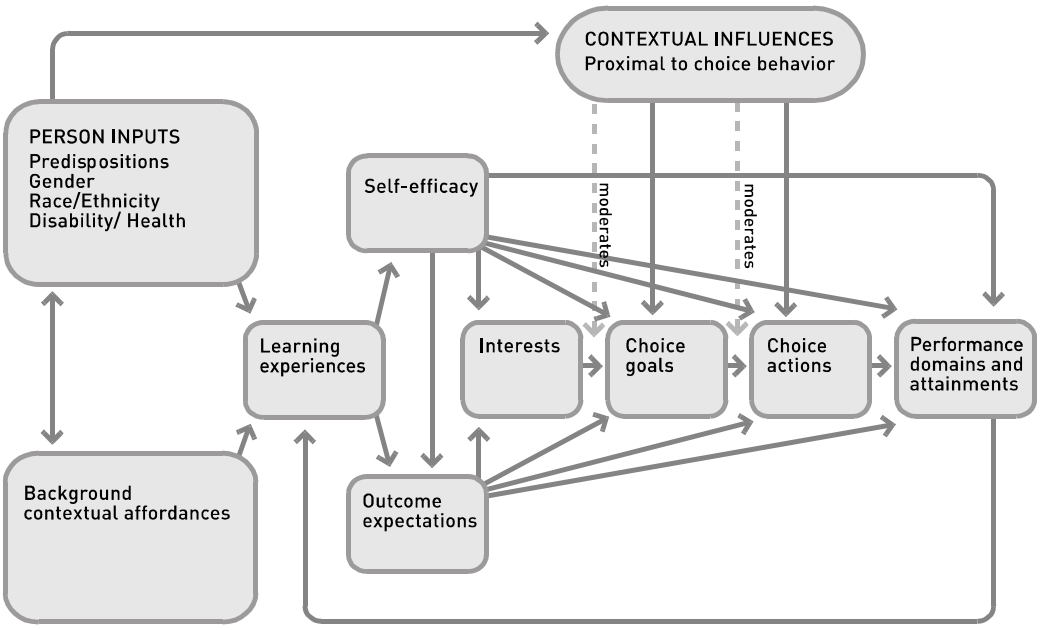

Figure 3. *Model of Factors Affecting Career-Related Choice Behaviour (Lent et al. 1994, 93)*

Lent et al. (1994, 105) claim that person factors—for example, gender and ethnicity—affect career interests, choices and performance and that they are partly mediated by the differential learning experiences that give rise to self-efficacy and outcome expectations. In this model contextual influences affect intentions and the purposes as well as the choice of an activity and the activity itself. Contextual influences affect different stages of the process, they help shape the learning experiences that fuel personal interests and choices and they comprise the perceived opportunity structure within which career plans are created. The researchers have divided the contextual influences into two subgroups: background influences (e.g.,

emotional and financial support; culture and gender role socialization processes), and proximal influences (e.g., personal career networks; structural barriers).

The career choice phase is divided into three component processes: the expression of a primary choice goal from among one's major career interests, actions designed to implement the choice, and subsequent performance attainments that create a feedback loop and affect the shape of future career behavior (Ibid. 94). Contextual influences may moderate the interaction of interests with goals and goals with action. Lent et al. suggest that the aforementioned interactions tend to be stronger among persons who perceive environmental support and few barriers, and weaker among those who have less environmental support. (Ibid. 107.)

Lent et al. (2002) discuss the similarities and differences with Krumboltz's theory and Social Cognitive Career Theory (SCCT). Both theories emphasize the learning experiences that shape people's occupational interests, values, and choices. Furthermore the influence of genetic factors, special abilities and environmental conditions on career decision is found in both frameworks. Lent et al. point out that Krumboltz's theory has its roots in social learning theory and SCCT stems more directly from social cognitive theory, which emphasizes cognitive, self-regulatory, and motivational processes.

Although the model of Lent et al. is comprehensive, it does not resolve the contextual influences into detailed factors or influences like the Systems Theory approach (Patton & McMahon 1999) and the Social Learning Theory of Career Development (Krumboltz 1979). Furthermore, Krumboltz's approach includes the process of educational and career choice.

Social Learning Theory of Career Development

The Social Learning Theory of Career Development by Krumboltz (1979) explains how educational and occupational preferences and skills are acquired and how selections are made. The theory identifies interactions between an individual's genetic factors, environmental conditions, learning experiences, cognitive and emotional responses and performance skills that affect decision making. The aforementioned factors and their combinations produce several different decision points at which the individual has one or more options. According to Krumboltz, "internal (personal) and external (environmental) influencers (constraints and facilitators) shape the nature and number of those options and the way in which the individuals responds to them" (Ibid. 19).

Krumboltz (Ibid.) suggests four categories of influencers that affect occupational selection. Each category can be further divided into factors, categories, events and conditions. The four primary categories are genetic endowment and special abilities, environmental conditions and events, learning experiences and task approach skills. These are listed in Table 12. The category of genetic endowment and special abilities includes gender and ethnic factors. The Environmental Conditions and Events category contains macrolevel conditions and events that may be due to human action (social, cultural, political and economic) or natural

forces. The significance of technological, economical and social changes on career choices is today unquestioned.

Krumboltz (Ibid. 23) divides learning experiences into instrumental learning experiences and associative learning experiences. In instrumental learning experiences the individual acts on the environment in such a way as to produce certain consequences. In associative learning experiences the individual learns by observing real or fictional models. Learning experiences generate task approach skills, which lead to specific career related actions. Task approach skills are skills that are formed in the interaction between learning experiences, genetic and environmental influences. These skills affect the outcomes of each task and overall outcomes for the individual.

Table 12. *Categories of Influencers of Occupational Selection (compiled from Krumboltz 1979)*

Influencer	Factors, Categories, Events or Conditions
Genetic Endowment and Special Abilities	• Race, sex, physical appearance and characteristics, intelligence and special abilities
Environmental Conditions and Events	• Number and nature of job opportunities • Social policies and procedures for selecting trainees and workers • Rate of return for various occupations • Labor laws and union rules • Educational system • Technological developments • Changes in social organizations • Family training experiences and resources • Neighborhood and community influences • Physical events such as earthquakes, droughts, floods and hurricanes • Availability and demand for natural resources
Learning Experiences	• Instrumental learning experiences • Associative learning experiences
Task Approach Skills	

Self-observation generalizations are defined as an overt or a covert self-statement evaluating one's own actual performance in relation to learned standards. According to Krumboltz (Ibid. 29), interests are one of the most important types of self-observation generalizations in career decision making, which influence future activities, chances to obtain new experiences and thus the choice of education and occupation.

Figure 4 presents the general model of factors affecting educational and occupational selection as a combination of the aforementioned influencers and the outcomes of their interaction (Krumboltz 1979, 32).

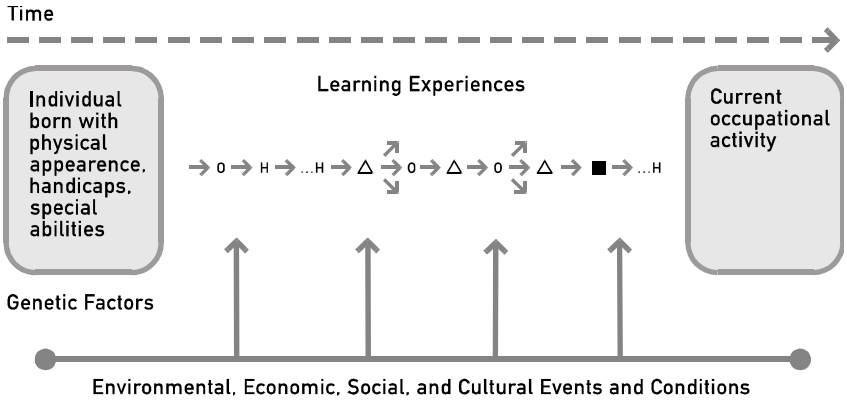

Figure 4. *General Model of Factors Affecting Occupational Selection (Krumboltz 1979, 32)*

The symbols used in the model are

O	Associative learning experiences
H	Instrumental learning experiences
△	Self-observation generalization
■	Task approach skills
→	is followed by
↗	
→	Individual chooses this alternative
↘	
…	Omitted events

Krumboltz (Ibid. 37) summarizes the process of career planning and development to be: "the sequential cumulative effects of numerous learning experiences affected by various environmental circumstances and the individual's cognitive and emotional reaction to these learning experiences and circumstances that cause a person to make a decision to enroll in a certain educational program or become employed in a particular occupation."

The advantage of Krumboltz's theory is that it visualizes the complexity of factors affecting educational and occupational selections and emphasizes the role of learning experiences.

Interrelationships of the Three Career Choice and Development Theories

Figure 5 shows the interrelationship of the three extensive theories of career choice and development that are used in this research. Systems Theory relates individual level and context level factors and presents essential content influences and stakeholders of each level. Social Cognitive Career Theory emphasizes person, contextual and experiential factors that affect career interests and career choices. The Social Learning Theory of Career Development defines the process and factors affecting occupational selection.

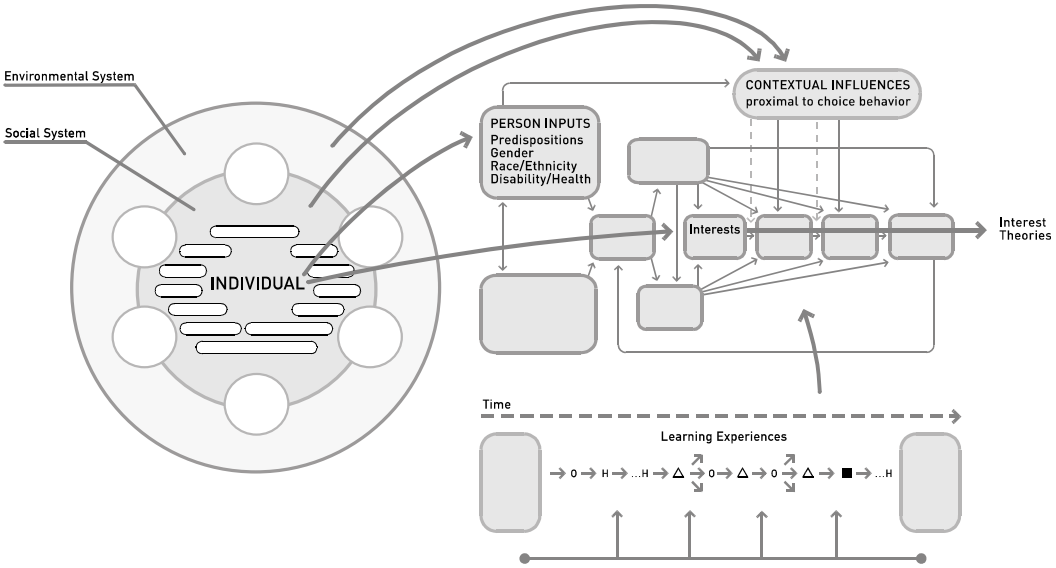

Figure 5. *Interrelationships of the Three Career Choice and Development Theories*

The Systems Theory framework shows that "the individual makes career decisions and choices over time in relation to the interaction in his or her life of a complex network of influences. Career in itself could be regarded as a system that is constantly molded by the interaction of influences." (Patton & McMahon 1999, 181.) Social Cognitive Career Theory reveals cognitive, self-regulatory, and motivational processes. The Social Learning Theory of Career Development explains the effect of learning experiences on individual career choice process. In the center of the diagram is the interest of the individual. Interest theories and research are discussed later in this chapter.

Career choice and development contexts are becoming more complex. The need for support and information for teachers, career counselors, peers, family and business organizations is increasing. The significance of background influences and proximal influences (Lent et al. 1994) as facilitators for or barriers to individual development cannot be ignored. Ruohotie (1999, 39) asserts that "a career is no longer a matter of individual responsibility and a relatively independent role. Instead it involves various networks and relationships, and the change and learning that take place through them." Relationship-based learning occurs in the interaction with various stakeholders in one's family, education and working life.

The career planning and development process in Krumboltz's theory (1979) parallels the nature of human action in symbolic interactionism (Blumer 1969). Action on the part of a human being consists of taking account of various things he or she notes and responding on the basis of how he or she interprets them. The things that influence that response may include wishes, objectives, available means for achievement, actions and anticipated actions of others, image of oneself, or results of actions. The actions may be started or stopped, abandoned, postponed, initiated or transformed. Human action is comprised of a continuous flow of responses to a dynamic environment. (Ibid. 17.)

The relational context and its significance in the understanding of career development have attained increasing attention in counseling psychology (Blustein 2004; Phillips et al. 2001; Whiston & Keller 2004). Thus, career choice and development models should incorporate relationship-based learning processes. These processes comprise not only the interaction network of a young student who is making his or her career choice, but also the networks of peers, families, business organizations and schools. For example, the interaction networks and relationship-based learning between the schools and the companies are essential when we define the facilitators of and barriers to contextual factors of career choice and development processes.

3.1.3 Prior Finnish Research of Career Choice and Development

This section introduces the essential Finnish research on career choice and development, which is arranged under contextual and individual approaches. A national perspective is chosen here because career choice and development is affected by cross-national differences, which are influenced by historical, cultural and political national characteristics (Kirkpatrick Johnson & Mortimer 2002).

Contextual Approaches

The focus of the research on contextual approaches has been socio-economic and socio-cultural issues as well as educational policy. Kivinen and associates have lead the main education-sociological research in Finland (Kivinen 1988, Kivinen et al. 1989, Isoaho et al. 1990, Kivinen & Rinne 1995). The aforementioned studies focus mainly on the situation in the mid 1980's when the Finnish education system was under reform.

Kivinen (1988, 447) observes that objectives that emphasize the interconnection between education and social ascent is inherent in the education system itself. The intention of students is to manage to get through the education system from one level to another and to get such formal qualification and grades that the pathways to proceed remain open as far as possible. In their discussion of education policy in Finland Kivinen et al. (1989, 149) assert the need for changes in the education system. The researchers propose that the education system needs to make individual choices possible, without any dead ends. Their propositions have been imple-

mented in the current education system, which is based on the General Upper Secondary Schools Act 629/1998, the Vocational Education and Training Act 630/1998, and the Vocational Adult Education Act 631/1998. This legislation established universal eligibility for further studies at universities and polytechnics for all students who have taken a 3-year vocational qualification.

The main theoretical basis for education-sociological studies has been the reproduction theory of Bourdieu & Passeron (1990), which has been used in several studies of educational selection processes. The distribution of cultural capital among groups or classes contributes to the reproduction of social structure. Market forces are one of the mechanisms through which social reproduction is accomplished. (Ibid. 11.)

In sociological studies the socio-economic status and educational background of the parents have been found to be the most significant factors affecting youths' choices of educational pathways. Students with high socio economic status seek to attend institutions of higher education (Ahola & Nurmi 1995). Kärkkäinen's study (2004) shows that the relative importance of the mother's educational level to the educational culture heritage of her child has increased due to the higher number of available schooling opportunities.

On the other hand, some studies suggest that the effect of the students' socio-economic status on educational choices is decreasing (Jokinen 1988; Lehtisalo & Raivola 1999). Antikainen et al. (2000, 328) suggest that in the 1990's Finland became an information society in which administrative personnel are an essential employee group. Thus, education is no longer as challenged to provide equality between blue collar and white collar workers. The key question in the future will be what the relationship between national and local decision making is and how to promote local education development.

Ahola and Nurmi (1995) have studied the educational choices of polytechnic and university students. Their research framework included the family, educational system and labor market. Ahola and Nurmi assert that the foundation of education and training is in the social status resources of the family: economical resources, cultural conditions and social relationships. The educational and occupational preferences of young people rise from these resources. The levels and sectors of the educational system confront these preferences with various supply mechanisms and the labor market further reformulates the preferences and possibilities. The focal questions are: "How can this kind of system direct the student flows in a way that satisfies the educational planners as well as the students" (Ahola & Nurmi 1995, 31). Although the researchers bring up the question of the preferences of individual students, the structure of their study highlights the family, educational system and the labor market (Figure 6).

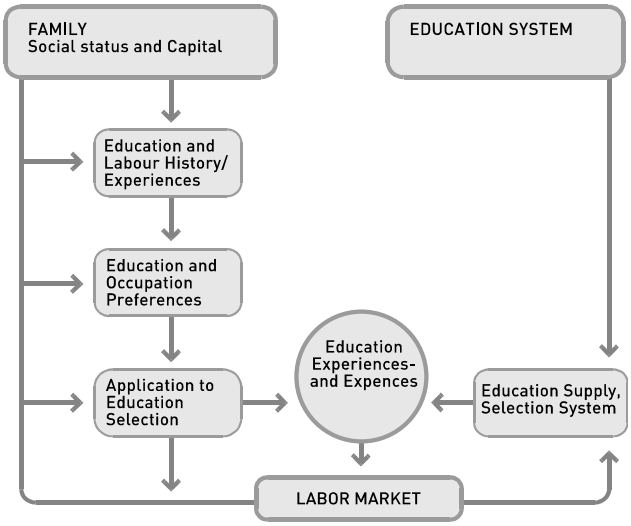

Figure 6. *The Framework of the Research of Ahola and Nurmi (Ahola & Nurmi 1995, 31)*

In their research Ahola and Nurmi (Ibid.) also studied the motives behind educational choices in higher education. These were found to be similar to those in several other studies. The motives are: common interest (62%), external factors to education (26%), occupational status (23%), content of work (22%) and status of education (20%). In the second phase of data analysis the researchers edited out the answers of 'common interest' and looked for other motives if they existed. They found that the remaining motives for educational choices were: content of work (15%), status of education (14%) occupational status (12%), common interest (11%). (Ahola & Nurmi 1995, 58-59) Thus, the results show that individual interest was the most significant influence on educational choices. The researchers claim, however, that the 'cliché like' answer of common interest does not really explain the student motives.

The focus in Nurmi's research (1998) was the educational choices of students with various social backgrounds. The researcher conducted his research by giving questionnaires to students applying to universities and polytechnics in 1994-1995. His results show that a family-qualification-occupation triangle constructs a closed loop in which "the new generation that emerges from education to the labor market obtains 'its own' social status" (Nurmi 1998, 21). The relationships between family, labor market, education and education system are illustrated in Figure 7.

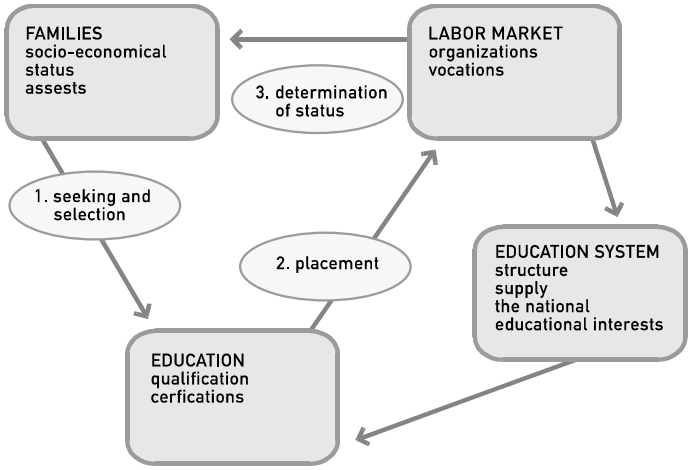

Figure 7. *Reproduction Process of Social Status (Nurmi 1998, 24)*

Nurmi (Ibid. 21) claims that there is a loop within the education system, which creates possibilities and sets regulations for the students as they seek to establish their pathway in society. The results of the research also indicate that self-selection of additional higher education is accomplished according to the reproduction model.

The aforementioned studies have focused on contextual factors and influencers of educational and career choice. However, they do not deal sufficiently with economic, social or technological changes, which are also essential to consider in today's complex contexts.

Individual Approaches

Recent Finnish studies that have taken a sociological perspective on individual approach issues have focused on gender, age and school achievements (Pirttiniemi 2000). In studies that have taken an educational psychological perspective the focus has been on the measurement of individual vocational interests (Muurinen 2004). Several researchers have examined the career orientation of students (Järlström 2002; Korhonen & Mäkinen 1995; Lehtonen 1999; Tiilikainen 2000; Vuorinen & Valkonen 2003).

Kasurinen (1999) approaches educational choices from an individual perspective. The researcher has constructed a theoretical model of the factors influencing adolescents' plans and future orientation. The model is presented in Figure 8. The theoretical model assumes that the factors affecting a young person's plans are: time (the present time the young are living), context (the individual's environment and society as a whole); the subject as an actor (describes the goal-orientation, personality traits, life history, interests, talent and skill); motivational elements (control beliefs, attitudes and subjective well-being); hobbies and interests (the subjects of interest in free time). (Ibid. 176.)

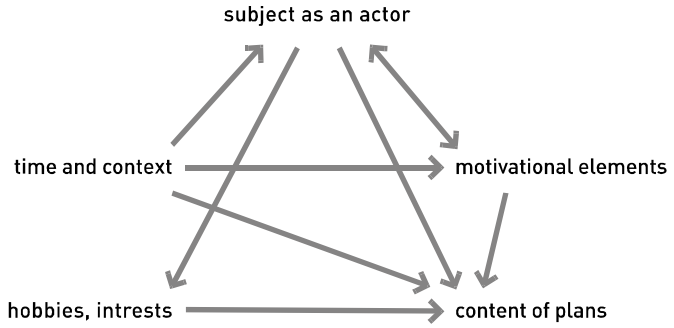

Figure 8. *Factors Affecting Future Orientation (Kasurinen 1999, 176)*

This schema seems not to acknowledge that young people have objects of interests beyond hobbies and free time. It also does not allow for the effect of time and context on interests (Deci 1992).

Ruohotie (1988, 69-71) discusses the significance of personal relevance or psychological meaningfulness in assisting the student in goal-directed action. The relevance experiences of young students can be affected by occupational structure and job characteristics. These correspond to the students' future expectations and also to their application and involvement motivation in education.

Several studies of career choice and development have examined the educational choices of university and polytechnic students. In a study of the educational choices of polytechnic students Lehtonen (1999) divided the choice orientation into three main categories: career orientation, branch orientation and easiness of studies. Students in the technical field in polytechnics are found to be branch oriented. This means that they appreciate good opportunities in working life, good earnings and the esteem of the branch**.** The primary criterion for their educational choices is an interesting branch, which is contained inside the branch orientation category.

Corresponding results have been found in several other studies dealing with the educational choices of polytechnic and university students (Korhonen & Mäkinen 1995; Lehtonen 1999; Tiilikainen 2000; Vuorinen & Valkonen 2003). According to Korhonen and Mäkinen (1995, 12-18), student orientation varies according to the educational field and the gender. In the technology sector polytechnic students are status oriented; that is, the esteem of the branch is important. Men and women in technical branches are found to be branch and status oriented.

The educational choices of graduates and pupils from comprehensive schools have attracted little interest among researchers. Educational decisions of graduates are, however, generally found to be the same among university and polytechnic students. The factors that affect the educational choices are: interestingness of the branch, opportunities of employment, wages in the branch, study time and the access to education (Jalkanen 1988, 61).

Korhonen (1997) found that pupils from comprehensive schools in the center of the region sought their study places from general upper secondary education and pupils from peripheral schools sought their study places from vocational upper secondary education. This can be explained by the socio-economic backgrounds of the

students. Korhonen (Ibid.) also found that young people have become more critical in making their educational choices.

The students are critical but some may also be uncertain. Järvinen (1999) studied students and their experiences in the transition phase from comprehensive school to upper secondary schools. He found four different types of student groups: 'culture reproducers' who had made clear choices at an early stage, frequently in line with the occupational tradition of their homes. These students identified with their parents and the role models of their families. 'Individuals' made their choices as a result of intentional reasoning, they built well-considered goals and had the support and encouragement of their family. 'Searchers' are students whose decision making process is ongoing and requires more time. They show loyalty to their parents but they have no role model in the family. 'Drifters' are students who have problems in various areas of life and identify with their peers and youth culture, while their relationship to their parents is distant.

Mäkinen (1998) has studied the maturity of career choices made by students in comprehensive schools. The results show that young pupils know that an occupation is something one has to have but the connection to the environment; standard of living, habitation or residential environment is weak (Ibid. 83). Muurinen (2004) found that by asking students directly about their career orientation and expectation it was possible to predict the future application behavior of graduates from general upper secondary education in 70% of the cases.

Savolainen (2001) found that the young generally believe that education pays off and the only way to get a job is to obtain proper vocational training. Savolainen asserts that general upper secondary education is the primary choice for students, whereas vocational upper secondary education is a choice of students who 'cannot' succeed in upper secondary education or are 'not interested in studying.'

The innumerable alternate education possibilities and continually changing economic, technological and social environment tend to create uncertainty in educational and career choices. Välijärvi (2004) claims that new skills are required to enter continually changing educational and labor markets. Students require new skills to manage from the first phase of their career development, the transition from comprehensive school to upper secondary level.

However, the researcher also claims that employers, teachers, career counselors and parents require new skills to give appropriate information about the world-of-work and sufficient support to young students' career decision making.

Contextual and Individual Approaches

Prior Finnish research on educational and career choices and career development has focused on either contextual approaches or individual approaches. The model of Growth Triggers and the Exploration Learning Cycle by Ruohotie (1996, 434) combines these two approaches. The model has been used primarily to describe the career development of adults. The model in Figure 9 shows that the exploration learning cycle, which may result when external pressures for change and the three

growth triggers—organizational, work role and individual—initiate a professional growth process.

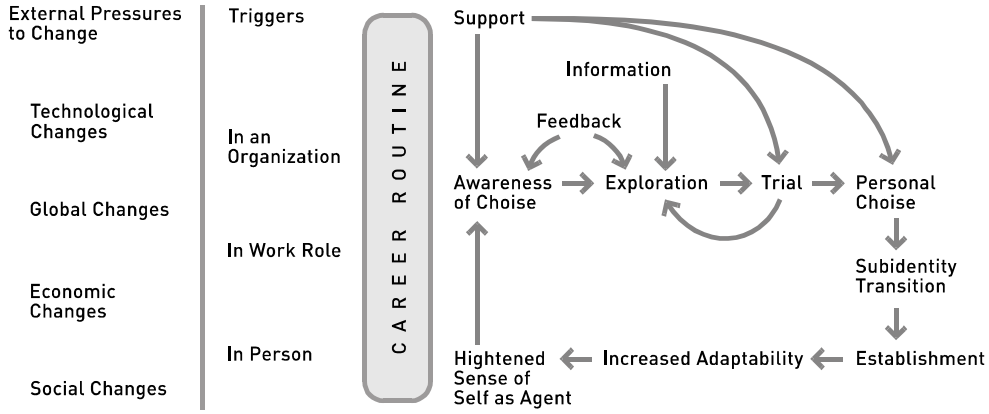

Figure 9. *Model of Growth Triggers and Exploration Learning Cycle (adapted from Ruohotie 1996, 434)*

External changes, for example internationalization, cause organizational changes, which influence the individual and thus cause changes in cognitive, affective and physical factors. These factors include such things as innovativeness, work involvement, desire for autonomy, growth motivation, career advancement expectancies, flexibility, dominance, expertise and health (Ibid. 422).

The model shows that the exploration learning cycle can be reinforced by external feedback and support. In the decision making phase, external information, advice and direction are useful.

3.2 Interest, Interest Development and Research of Interest

3.2.1 Concept of Interest

To make vocational education attractive one has to catch the attention and interest of the student. In deciding on educational and occupational career paths, interest development plays an important role (Krapp 2002b; Lent et al. 1994). Morgan et al. (2001) suggest that the real or anticipated experience of interest when engaged in career-related activities is a critical influence on career choice. Interests influence choice of future activities, opportunities to learn new skills, chances to obtain new experiences and the choice of occupation (Krumboltz 1979, 29). Lent et al. (1994) propose that career choice is a function of individual interests that orient persons toward activities. The environment supports or fails to support the individual. The circumstances for individuals vary in time and place. Interaction between person

and context can be seen as a series of snapshots, not as continuous process. (Patton & McMahon 1999, 162.)

As described earlier in the review of Finnish research literature on career choice and development, the degree to which the occupational branch or educational sector/field is seen to be interesting by the student is the most significant motive for educational and career choices (Ahola & Nurmi 1995; Korhonen & Mäkinen 1995; Lehtonen 1999; Luopajärvi 1995; Savolainen 2001; Tiilikainen 2000; Vuorinen & Valkonen 2003). In some studies this factor has been ignored and closer consideration has been given to the second or third important factors in educational choice. These included content of work, status of education, school success or good employment opportunities (Ahola & Nurmi 1995) or the fact that the student had no possibility of getting into another educational field (Luopajärvi 1995).

Education seekers' motives for educational and career choices cannot be simply explained with a 'cliché like' reference to interest. It is necessary to delve more deeply into the concept of interest and ask questions such as: Why is one branch more interesting than the other? When, how and under what conditions does interest develop? Is it possible to arouse and maintain interest? A general definition of interest can be stated as follows: "interest occurs when, in belief that it will be advantageous to the self, individuals attend environmental object and thereby narrow the distance between them and that object" Savickas (1999, 21). Interest indicates awareness of and attention to some environmental person, object, or activity. "As a psychological state, interest describes individual's position in relation to a single, specific object or activity" (Ibid. 33).

Interest can be deemed to emerge from the structure of an individual's personal senses in her personal culture at a given time. Interest is an internally constructed set of signs that guides an individual towards perseverance in her acting, thinking and feeling. The level and nature of interest are constantly changing. It can arise and disappear and at another time lead to new objects and forms of interest. (Valsiner 1992.) The study of interest concerns persons and activities within a social context. Context may have a considerable effect on that interaction and thus it affects a person's interest (Deci 1992). Krapp and al. (1992, 5) describe the concept of interest as a "phenomenon that emerges from an individuals interaction with his or her environment."

Savickas (1999, 50-51) compiles the multiple meanings of interest:

> "Interest denotes a complex, adaptive effort to use one's environment to satisfy needs and fulfill values. Interest can be described as a state of consciousness characterized by (a) readiness to respond to particular environmental stimuli (including objects, people, activities, and experiences) or to thoughts about these stimuli. When activated, this attitude or outlook prompts (b) awareness of a stimulus leading to (c) selective attention that narrows the perceptual field to more clearly illuminate the attention-exciting stimulus. This attention is accompanied by (d) an affective state of pleasant feeling and (e) an evaluating of liking that may prompt (f) an impulse to do something regarding the stimulus (such as learn more about it) in (g) anticipation of the future gratification or satisfaction. This anticipation passes into (h) volition that steers goal-directed striving toward the stimulus and maintains (i) a course of action that fulfils some personal desire, need, or value. If the indi-

vidual identifies self with the activity, then the individual may incorporate it as a new interest into an existing self-concept system. The symbolic presentation of an interest is usually signified as the stimulus that wakes attention and action. “

German research group (Schiefele et al. 1983) made the first educational application of the theory of interest. Krapp (1999) summarizes the basic ideas of an educational-psychological theoretical approach in the following statements:

1. The theoretical framework is based on meta theoretical premises. They refer, for example, to the question of the ultimate aims of an educational theory of motivated learning.

2. The individual, as a potential source of action, and the environment as the object of action, constitute a bipolar unit. An interest represents or describes a specific relationship between a person and an objective of his or her ‘life-span.’ It can be interpreted as a specific ‘person-object-relationship.’

3. It is assumed that an individual experiences and cognitively represents his or her environment in a meaningful structure. An object of interest can refer to concrete things, a topic, a subject-matter, an abstract idea, or any other content of cognitively represented life-span.

4. The most important characteristics of an interest specific relationship refer to one’s values and feelings.

5. An interest-based person-object-relationship can be investigated on two levels of analysis: individual interest and actualized individual interest.

6. The emergence and development of an individual’s central structure of (individual) interests is often related to the changes in motivational structure of a person’s self. *(Krapp 1999, 25-26)*

Krapp et al. (1992, 5) have outlined the relationship between various concepts of interest. They find three major points of view in interest research. These are: interest as a characteristic of the person, interest as a characteristic of the learning environment and interest as a psychological state (Ibid. 9). Krapp (2002a) has further developed the conceptual framework of interest research, which is illustrated in Figure 10.

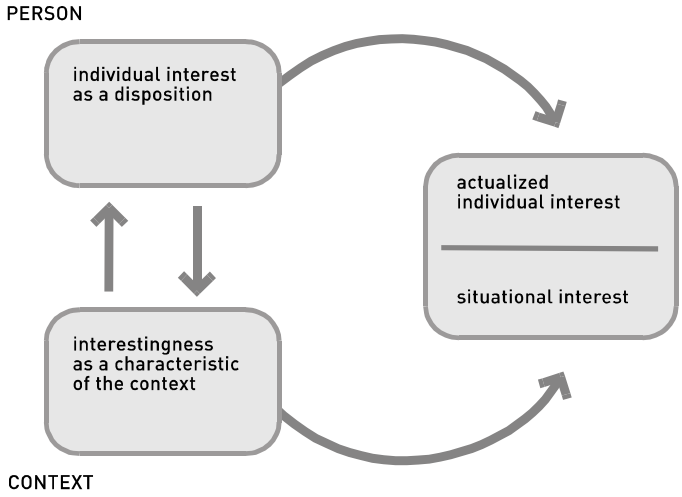

Figure 10. *Conceptual Framework that Organizes Research on Interest (Krapp 2002a, 406)*

In Figure 10 the concepts of interest are divided into 'individual interest' and 'situational interest.' Individual interests are considered to be relatively stable and are usually associated with increased knowledge, positive emotions, and increased reference value. It is a characteristic of the person. Situational interests are generated by certain conditions and/or concrete objects in the environment (e.g., texts, films) and they tend to be shared among individuals. Situational interest may have a permanent effect and inspire individual; that is, an internalized personal interest can result from engagement with an interesting context. Situational interest can be described as a motivational state that encourages an individual to interact with the environment to acquire new information (Hidi & Anderson 1992; Krapp 2002a; Krapp et al. 1992).

Pressick-Kilborn and Walker (1999) criticize the distinction between individual and situational interests. The researchers assert that interest should be examined from a socio-cultural perspective to enhance an understanding of the developmental interrelationships between individual and the situational interest. The researchers also stress that interest is a dynamic and developmental process of interaction between the individual and the situation. (Ibid. 13-17.) Interest can be limited and promoted. Canalization of interest and the process of interest are not yet investigated sufficiently.

Interests are always directed towards certain objects (Krapp 2003; Schiefele et al. 1983; Schiefele & Krapp 1987). The object of interest can refer to concrete or abstract matters. These can be concrete things and topics, abstract ideas or any other content of the cognitively represented life-span. The environment provides possibilities for experiencing new objects of interest, but it also creates a complex structure of conditions that influence interest. (Krapp 2002a.) To attract interest requires the object of interest and the person to interact. The interaction can be abstract or concrete and it can be termed object engagement or transaction. The object of interest exists outside the person, although the person's conception of the object

is a prerequisite (Ibid. 411). The objects of interest represent values to an individual, some of which are preferred over others (Schiefele et al 1983, 14).

In symbolic interactionism the worlds that exist for human beings and for their groups are composed of objects and these objects are the product of symbolic interaction. It is important to remember that objects may have different meanings for different individuals. (Blumer 1969, 10.) We do not know what is the object of interest for the student who applies to education. The object can be the study place, friends, education itself, work, occupation, income or anything else. In order to understand action of people it is necessary to identify their world of objects (Ibid. 11).

According to Ruohotie (2000b; 2003), intrinsic interest is one characteristic of self-regulation. Self-regulation involves a complex of processes such as setting goals for learning, using effective strategies to organize and rehearse information, and using one's resources effectively. A naive self-regulator shows little interest in the skill or topic to be learned and attributes problems to external factors such as an uninspiring teacher or boring task. A skillful self-regulator shows genuine interest in the skill or topic to be learned, searches for learning opportunities, exerts effort and perseveres despite difficulties. The development and use of an individual's self-regulatory ability is influenced by the environment, including culture, family and peers. (Ruohotie 2003.)

Prediger (1979) asks the question: What are the relative roles of 'cognitive information' and 'affective information' in career choice? The researcher believes that the role of conation in career choice is equally important to consider. The relation of motivation, volition and objects of interest can be described by examining the taxonomy of mental characteristics in Figure 11. The self-regulation capabilities of a person's professional development are situated in the conation area of a person's mental characteristics taxonomy (Ruohotie 2002a, 29). Structures of motivation in conation area are achievement orientations and orientations towards self. Structures of volition are action controls and orientations towards others. Objects of interest and pattern constructs also direct the development of a person. Conation refers to those mental processes that help the development of a person, a conscious tendency to strive for something (Ruohotie 2002b, 46).

Ruohotie (2000a, 92) describes the relevance of a task in terms of three value aspects: performance value, interest value and utility value. Interest value refers to a person's internal interest towards the task. Relevance beliefs are connected to a person's goal orientation and the intensity of behavior. Objects of interest create positive attitudes within a person and as a result of the development of these attitudes the person gives priority to certain tasks and efforts in his or her action. (Ruohotie 1998, 35.)

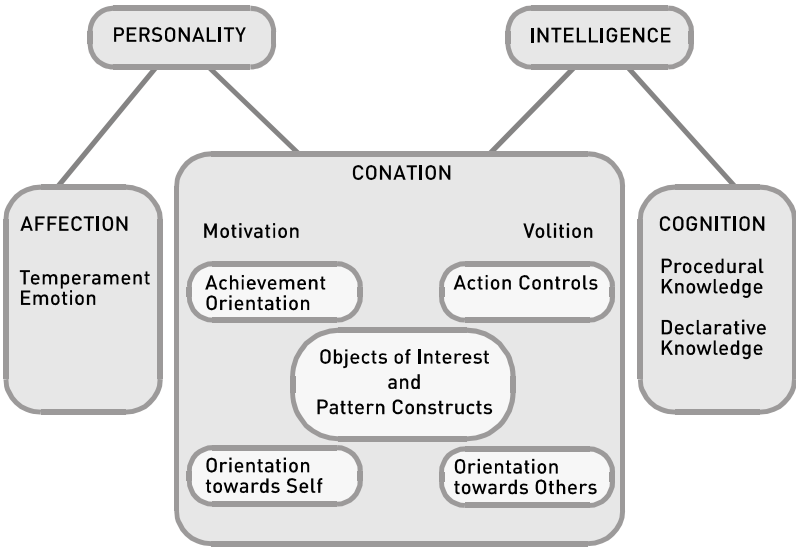

Figure 11. *Taxonomy of Mental Characteristics (Ruohotie 2002a, 29)*

Savickas (1999) looks at interest in terms of four outcomes: interest focuses attention, interest arouses feelings, interest sets direction and interest creates activity. Savickas examines these four through the lens of four major psychological systems in a taxonomy developed by Woodworth (1964): the associationist system that emphasizes cognition, the structuralist system that emphasizes affection, the purposivist system that emphasizes conation and the functionalist system that emphasizes action. Each of these systems is an essential element in the psychology of interest. Savickas (1999, 33) summarizes as follows, "interest focuses attention, arouses feelings, steers direction and involves activity."

In this research it is assumed that: *Interests expedite person-environment interactions into dynamic processes that guide an individual towards perseverance in her acting, thinking and feeling* (adapting Valsiner 1992 and Savickas 1999).

Vocational interests can also be understood the preceding concept of interests. Crites (1999, 163) asserts that vocational interests "can be defined not as aptitudes, not achievement, not skills, not personality, not career maturity—but preferences for different life activities." Borgen (1999, 383) says that today the meaning of vocational interests are informed by topics such as genetics, developmental psychology, personality, individuality, abilities, agency and self-efficacy. Crites (1999) points out that vocational interests can be expressed, manifested, tested, inventoried and experimental, but that only inventoried interests have been extensively studied and that a comprehensive theory of vocational interest is required to integrate the five operational definitions.

Morgan et al. (2001) found four types of reasons for career choices: interesting (e.g., enjoy it, think it would be fun, like it), people oriented (e.g., working with people, serving others, helping others), extrinsic rewards (e.g., pay, status) and perceived competitions (e.g., being good at it). According to their model, men and women are likely to differ in their perceptions of what makes a career interesting. Women may find physical and mathematical sciences less interesting because these careers seem to offer fewer opportunities for interpersonal involvement than do

other options. Men may find physical and mathematical sciences more interesting because these careers are perceived as offering greater opportunities for extrinsic rewards. However, both men and women are likely to place greater value on personal goals than extrinsic rewards. The researchers found two primary ways in which men and women differ: women want to have a career that involves others and men want to have career that provides high pay and status.

Career interests during adolescence have been found to be stable by some researchers (Mullis et al. 1998) and unstable by others (Krumboltz 1979). Swanson (1999, 146) claims that interests show a substantial amount of permanence over long periods of time. However, individuals vary widely in degree of stability, and stability seems to increase with age.

3.2.2 Development of Interest

The process of interest development repeats itself continuously over the life-span (Lent et al. 1994). People form interests in activities in which they consider themselves to be efficient. Positive outcomes are essential to interest development, and it is difficult to form interests in those areas where self-efficacy is weak and expected outcomes are negative. (Bandura 2000; Lent et al. 1994.) Figure 12 presents a model of interest development from the social cognitive framework of career development by Lent, Brown and Hackett (1994).

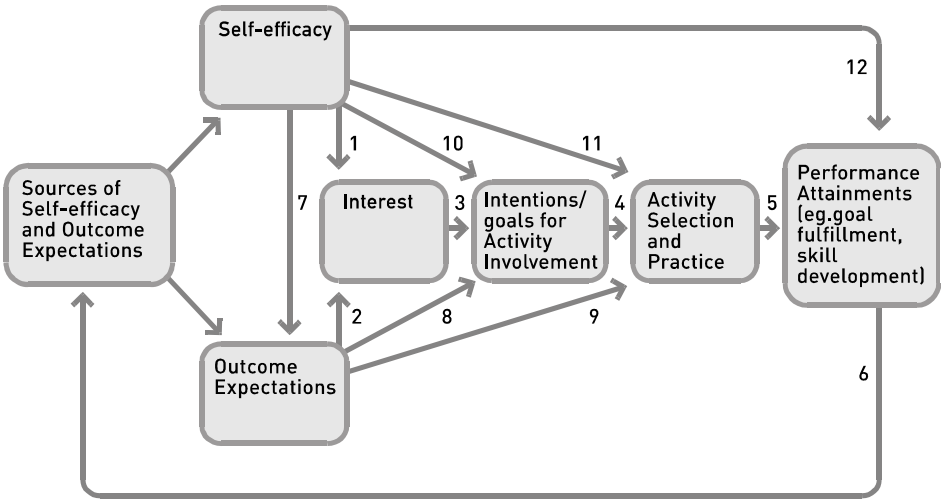

Figure 12. *Model of How Career Interests Develop Over Time (Lent et al. 1994, 88)*

The process of interest development in Figure 12 is formed as follows:

Path 1 Self-efficacy is essential factor in formation of interests.
Path 2 Outcome expectations are another essential factor.
Path 3 Emergent interests lead to goals for further activity.
Path 4 Activities increase the likelihood of activity and task selection.
Path 5 Activity involvement affects performance (i.e., success and failure).
Path 6 Revision of self-efficacy and outcome expectancy estimates.

Path 7 Outcome expectations are partly determined by self-efficacy.
Path 8 Outcome expectations may affect activity goals.
Path 9 Outcome expectations may contribute directly to activity choices.
Path 10 Self-efficacy perceptions exert a direct influence on activity goals.
Path 11 Self-efficacy perceptions also exert a direct influence on activity selection.
Path 12 Self-efficacy contributes directly to performance. *(Lent et al. 1994, 89-90)*

The model assumes that the self-efficacy and outcome expectations are foundational factors in interest development. The sources of self-efficacy are derived from the context of a person. Lent et al. (Ibid. 89) state that "through activity engagement, modeling and feedback from the important others, children and adolescents refine their skills, develop personal performance standards, form a sense of their efficacy in particular tasks, and acquire certain expectations about the outcomes of their performance." Bandura (2000, 424) asserts that perceived efficacy creates interests through engagement in activities and self-satisfaction. Furthermore, interests are encouraged by activities which enhance personal efficacy. Symbolic interactionism also sees that fundamentally human groups or society exist in actions and must be seen as people engaging in action (Blumer 1969, 6).

Krapp (2002a) claims that interest has a tendency to grow and an interested person is inclined not to be content with his or her current level of knowledge or abilities in an area of interest. Interest-triggered action is connected to positive emotional experiences. To stabilize interest for a longer period requires situational interest to be stimulated externally and the existence of a genuine individual interest. The studies of Krapp and associates support the hypothesis that the quality of emotional experiences has an influence on the emergence and stabilization of epistemic interest (Krapp 2003, 74).

Krapp (2002b) divides the development of interest in childhood and adolescence into four stages: the first stage is in early childhood, the second stage is at the age of four, the third stage is between the ages of 11 and 13 and the fourth stage is during adolescence. The first stage can be called universal interest, which means that the interests are nearly identical for all children at a particular phase of development. The second stage of interest is at the beginning of the emergence of one's awareness of gender and one's gender role. The third stage of interest development begins when children start to be conscious of society and the family. Identification with a social group determines their expectations for their future position in society. At this stage young people also revise values, goals, preferences and aversions. The fourth stage of interest development is in adolescence when interest has an individualized character, which later determines the educational pathway and the choice of occupation. (Ibid. 392-393.)

A person's self is subject to permanent changes when changes in social and physical environments stimulate and force the individual to set up new goals of action and development (Krapp 2002a, 409). This raises the question: What conditions influence the interest of a student when he or she is making decisions concerning his or her educational and career choices? Osipow (1979, 109) asserts that

"the tendency of interests to become increasingly narrow as an individual matures so that vocational preferences and interest development tend to be more a matter of the elimination of alternatives that the seeking out of chosen alternatives."

Interest development from situational interest to individual interest is represented in Figure 13. Krapp (2002b) defines two prototypical interest steps from an ontogenetic perspective.

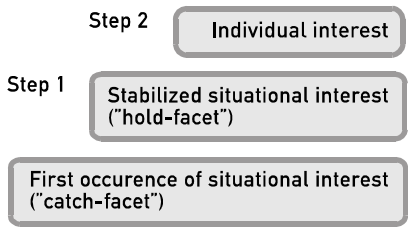

Figure 13. *Three qualitatively different levels and two ontogenetic steps of interest development (Krapp 2002b, 399)*

The stages of interest development are: "a situational interest awakened or triggered by external stimuli for the first, time ('catch facet'); a situational interest that lasts during a certain learning phase ('hold-facet') and an individual interest that represents a relatively enduring predisposition to engage a certain object-area of interest" (Ibid. 398). In the consideration of the interest and attractiveness of an educational program, the 'catch' and 'hold' facets are essential. Savickas (1999, 19) points out that "Without awareness and attention to something there can be no interest." Catching interest means finding various ways to stimulate individuals' attention, and holding interest means finding ways to empower individuals. Catching interest is essential in the phase of educational entry when a student has to be drawn to a specific educational field in order to make an application to participate in a particular program. Maintaining interest is essential when the student's interest to remain in education has to be sustained.

3.2.3 Research of Interest and Interest Development in Vocational Education

The research on vocational interests in relation to career choice has been relatively extensive (Savickas & Spokane 1999). However, research on interest and interest development during vocational education has not had much attention.

Athanasou and Cooksey (2001) have studied the factors that influence interest in vocational education subjects. The researchers make a distinction between individual interest factors and situational factors. Individual interests are content specific and characteristic of a person's behavior, situational factors promote attention and development of specific interest. Twenty factors affecting subject interest were found, from which career interests were rated more importantly than other factors. The results indicated that longstanding dispositions dominate a person's perceptions. Results also indicated that gender, age or mode of study did not effect the

extent of subject interest. A model in which the interests are divided into three factor groups—individual, contextual/situational and other factors—was found useful. It is shown in Figure 14.

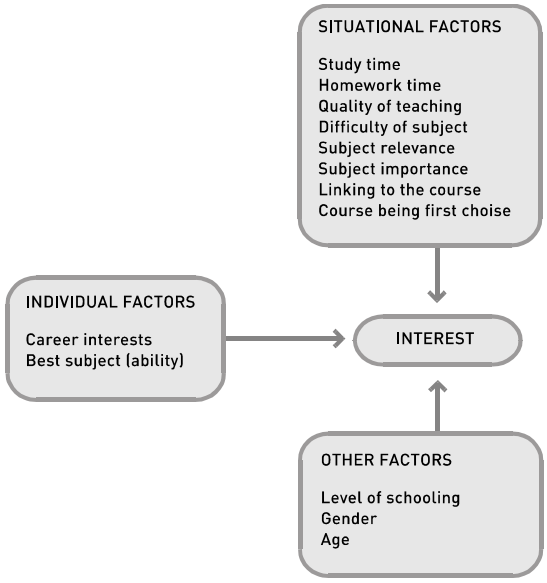

Figure 14. *A Tentative Model of Individual, Situational and Other Factors Affecting Subject Interest (Athanasou & Cooksey 2001, 3)*

Although the factor groups in this research are useful, the limited analysis of situational factors and the separation of individual factors (career interests, best subject ability) from other factors (age, gender, level of schooling) makes it appear to be incomplete. This research does not go far enough in categorizing either the main factors or the sub-factors. A wider set of factor groups and factors could lead to a more useful model of subject interest. However, the important results the work by Athanasou and Cooksey (2001) are that career interest does not affect vocational education only in the entry phase, but also throughout the educational program.

Interests, motivation and volition are part of the conation dimension in the taxonomy of an individual's mental characteristics (Ruohotie 2002a, 29). Luopajärvi (1995, 69) has compiled the factors that affect the motivational basis of students in upper secondary vocational education and training. These factors are: relationships between students (solidarity, competition, friendship); relationships between students and teachers (equity, support and encouragement, consideration); meaningfulness of the studies (modernity, practicality, cooperation with working life); organization of education (participating and possibilities to interact, objective orientation, liability distribution); good class discipline; and physical environment (modernity of equipment, machines and materials).

Lewalter et al. (2001) have studied the development and change of general education interest amongst students in vocational institutions in Germany. The results are represented as diagrams in Figures 15 and 16. The results show that education interest decreases during vocational education and that it increases again later among those students who have a clear plan to work in the particular field after

they graduate. The upper curve represents the students who plan to work in the field for which they are training (n=35), and the lower curve represents the students who have no such plans (n=96). Lewalter et al. also discovered that interest during vocational education seems to decrease more among male students than among female students.

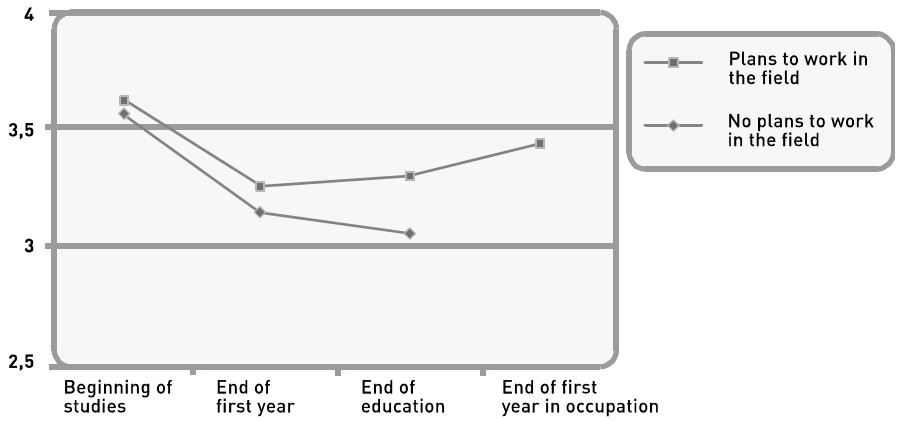

Figure 15. *Education Interest During Vocational Education (Lewalter et al. 2001, 23)*

Figure 16 shows that education interest is significantly lower among students who did not succeed in getting into a program of their first choice (curve 'Not first choice') compared to those who were accepted into the program they requested (curve 'First choice').

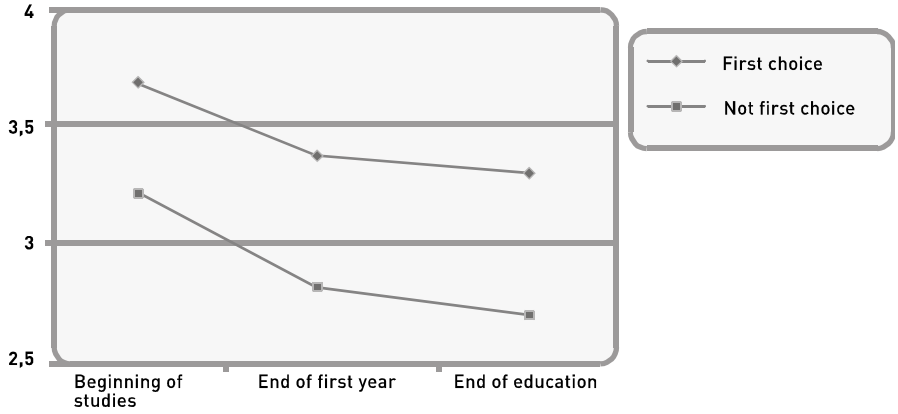

Figure 16. *Education Interest During Vocational Education in Relation to Occupational Wish (Lewalter et al. 2001, 24)*

The results also reveal that experience during initial entry and the first year in a program is critical in holding the interest of the student.

Krapp and Lewalter (2001) have studied interest development during vocational education in both school and company contexts. Interviews of students were conducted at the end of the first year (Interview I) and at the end of program (Interview II). Table 13 presents the total number of reported interests in the interviews and the subjectively recognized contextual source of interest (school or company).

Table 13. *Number of Reported Interests in Interviews and Subjectively Recognized Contextual Source of Interest Development. (Krapp & Lewalter 2001, 222)*

Sample		Total Number of Interests	Recognized Source of Interest School %	Company %
Interview I (n = 49)	All Interests	111	19	81
	Most Prominent Interest		12	88
Interview II (n = 71)	All interests	181	15	85
	Most Prominent Interest		3	97

The results of the study show the significance of context in interest development. On-the-job learning periods in companies raised interest remarkably compared to school-based education. Nearly all main interests (97%) were traced to the learning context in company at the end of vocational education and training. The results confirm that it is possible to affect the interest development of students with educational arrangements either in schools or in the workplace.

On-the-job learning in Finland offers benefits for all parties involved, for the school, the society, the companies and the student. For the student, on-the-job learning provides an opportunity to work with real-life problems in a genuine working community. This makes it easier to get a job after school and the entry into the world-of-work becomes easier. (Ministry of Education and National Board of Education.) According to the National Board of Education (1999, 14) on-the-job learning is also assumed to increase the attraction of education.

3.3 Concept of Attractiveness and Context Level Perspectives

3.3.1 Concept of Attractiveness

In Finnish the term *vetovoimaisuus* (attractiveness, appeal) has the synonyms *houkuttelevuus* (temptation) and *kiinnostavuus* (interestingness). In this research the term attractiveness (*vetovoimaisuus*) is chosen, because the term is already in use in the literature (Bainbridge & Murray 2000; Koch & Reuling 1998; Opetusministeriö 2000; Opetusministeriö 2004a).

Lasonen and Manning have studied the standing of vocational education in comparison to general education in various European projects at post-secondary level. In some of their studies the researchers have decided to use the term 'standing' instead of attractiveness. They explain their choice in the following way: "the term attractiveness is related to behavior or to attitudes held by individuals or groups and the term is a socio-psychological concept" (Lasonen & Manning 1999,

3). However, in some of their studies the term attractiveness is used. In this research attractiveness of vocational upper secondary education and training is discussed in reference to vocational education design concepts. The focus is on contextual influences and an individual's interaction with his or her environment rather than on psychological changes within the student.

Lasonen (1999a, 13) describes the attractiveness of education in terms of the number of students participating in education and the flexible possibilities for further studies. To measure the esteem of vocational education and training the following measures are used: the offered and accepted study places and a comparison to the same ratio in general education, the number of public and private programs available, a comparison of occupational wages between various educational pathways and the value in qualifying a student for further studies if desired.

The lack of attractiveness of vocational education and training has also been identified in other European countries. The elements of attractiveness may be largely generic but they are also somewhat country-specific, chiefly because of the variable status of vocational education compared to general education in different countries. (Koch & Reuling 1998.) Koch and Reuling (Ibid. 6) assert that the appeal of vocational education and training depends to a large extent on the "perceived subsequent earnings and career opportunities, the social prestige associated to the occupation and the opportunities of further educational development that are open to the individual."

Attractiveness of vocational education is often considered narrowly in terms of the actions taken to attract students to apply for certain study places. However, attractiveness of vocational education should actually be understood to comprise the whole process of vocational education, from applying to a particular educational program through the transition from school-to-work and beyond into actual work experience. The elements of attractiveness of vocational education have not been studied in this way as a holistic framework in prior studies. Instead, the various parts of career choice and development have been studied separately as presented in the discussion of contextual and individual approaches to the topic earlier in this chapter.

Attractiveness is an essential research subject in regional studies (Kotler et al. 1999; Raunio 2001; Raunio 2002a). Education is now understood to be an essential part of the attractiveness and competitiveness of regions. In urban and regional development studies Raunio (2002a) has investigated how a skilled labor force from abroad can be attracted to the Finnish work community. Raunio (Ibid. 15) has defined the characteristics and 'forces' of attractiveness of a region. The five main characteristics of attractiveness of urban districts are: creative problem solving environment, economical environment, social environment, the functional environment and the residential environment. Each characteristic or environment contains several sub-elements.

Raunio (Ibid.) has constructed the characteristics adapting Linnamaa (1999, 26), who has defined the elements of competitiveness of urban districts. These elements are infrastructure, networks, institutions and functioning development networks, companies, human resources and the quality of residential environment. The elements of attractiveness and competitiveness have different roles in creating

attractiveness, some elements can be affected and some not—for instance, legislation and taxation can be affected only indirectly. The elements are also interdependent. (Linnamaa 1999; Raunio 2002b.)

The elements/circumstances of attractiveness and competitiveness represented by Linnamaa and Raunio are primarily contextual factors such as economical and social environment and infrastructure. Raunio (2002a 45) defines the sub-elements of attractiveness in creative problem solving environments to include thriving and competence intensive companies that have a good reputation and institutions that support the companies; that is, research and development units and educational institutions. Social environment is a matter of the individual's social network and the social atmosphere of the community. Thus, the sub-elements consist of institutions and social networks and the main elements consist of macrolevel environments. Also, individual aspects are considered. Raunio (2002b, 59) asserts that the attractiveness of the field of choice is a result of an individual's viewpoint: mental images, motives and preferences, accessibility and experiences. Raunio and Linnamaa (2000, 36) feel that attractiveness develops when the preferences of a person and the characteristics of urban regions are compatible. Without this compatibility there will be no attractiveness regardless of the strength of the individual's desire or the inherent merits of the region. In both educational and regional efforts to improve attractiveness, the actions taken are intended to attract people from certain target groups.

In the beginning of the research the researcher used the following definition of attractiveness: *attractiveness of an educational field is the standing of the field in the range of choices of the education seekers. The range of choices consists of the possibilities that the education seekers know and what they prefer as their potential study places* (adapting Raunio 2002a, 15. The definition is anticipated in the process of the research.

3.3.2 Contributors to and Detractors from Attractiveness

In this research the *detractors from attractiveness are those factors that do not support the career choice and development of students. The contributors to attractiveness are the factors that support career choice and development of students.* Patton and McMahon (1999, 175) assert that the influences of the elements in the systems theory framework of career development change over time and that they can be understood as 'push' and 'pull' factors in relation to certain decisions and the individual's career path.

Jackson and Nutini (2002) have studied resources for and barriers to career learning. The researchers have used Krumboltz's (1979) Social Learning Theory of Career Development and Counseling as a theoretical framework. The barriers to and resources for career learning were examined in their contextual and individual aspects. The researchers have not created any sub-categories of the context and the study is concentrated mainly on the social context of adolescents. The study was conducted with members of disadvantaged groups that do not have equal access to education and career opportunities. The analysis of the study suggested four central

types of barriers to and resources for career learning: contextual barriers, psychological barriers, contextual resources and psychological resources. These types are described in Table 14.

Table 14. *Barriers to and Resources for Career Learning (Jackson & Nutini 2002, 10)*

Barriers to Career Learning	
Contextual Barriers	Psychological Barriers
• Unsafe environment • Discrimination • Low income • Negative social support • Negative role models	• Unrealistic belief in equal opportunity • Negative self-efficacy for academics, mathematic, and relationships • Limited coping strategies
Resources for Career Learning	
Contextual Resources	Psychological Resources
• Positive social support • Positive role models • Accelerated programs	• Transferable skills • Coping efficacy • Coping strategies • Constructive self-efficacy for academics, mathematics, and relationships

Social support and role models can be either contextual barriers to or resources for career learning. Low income and unsafe environment are strictly contextual barriers. Self-efficacy, coping strategies and transferable skills are the psychological resources required when negative self-efficacy is a psychological barrier.

Gordon (1995, 37) claims, that "human activity interacts with changing sociocultural contexts that can either facilitate and allow, or constrain and frustrate, behavior and development." He also says that those structures that frustrate or facilitate have to be understood from the perspectives of various people. Because people come from different backgrounds and cultures, the things that act as rewards for some may be penalties for others.

The following sections discuss the macrolevel, institutional level and microlevel perspectives on the attractiveness of vocational upper secondary education and training. Macrolevel perspectives deal primarily with the education system. Institutional level perspectives deal with career counseling and information about educational possibilities. Microlevel perspectives deal with the socio-economic background and gender of the education seekers. *Each observation level contains elements of attractiveness, and each of these elements contains specific factors that affect the educational choices of the student.*

3.3.3 Macrolevel Perspectives on Attractiveness

The principles and practices of vocational education and training are determined and affected by economic, cultural and social features and also the way in which the occupational structures have evolved (Lasonen 1997, 389). According to Bainbridge and Murray (2000, iv) in EU Member States "vocational training has developed as an instrument of employment policy in response to economic and social change to facilitate adaptation to the changing structure of activity and content of jobs, to integrate young people and other groups into the labor market and to promote equal opportunities." Generational cohorts are decreasing and this decreases the number of young people seeking an educational pathway. Changes in age groups as well as the economic and social changes require the education system to respond. Finland's national success is based on competence and knowledge. In order to maintain our standing, the education system needs to be renovated. (Sitra 2000.)

In 1989 Kivinen et al. (1989, 149) proposed that the education system needs to make individual choices possible without any dead ends. The 1998 Education Acts gave universal eligibility for further studies at universities and polytechnics to all students that have taken a 3-year vocational qualification. Ilomäki (2001) states that the possibility for further studies has been utilized in experimental schools but it still needs to be widely applied. "Finnish parents love matriculation examination" (Ibid. 178). The researcher reminds us that information about changes in educational structures for all the stakeholders of education (teachers, personnel, students etc.) is an essential factor, which affects the progress of reforms and changes. According to Ilomäki (Ibid. 131-132) improving the attractiveness of education has resulted in a notable increase in all experiments: upper secondary and vocational experiment, flexible education experiment, youth school experiment and after the 1998 Education Acts.

Mäkinen (2000) studied age cohorts of students that finished comprehensive school in the years 1985 and 1993. With empirical examples the researcher investigated the reasons for seeking the different educational pathways and the impact of the educational paths on individuality. The study shows that the educational paths of students that finished their comprehensive school in 1985 could be predicted by the wishes of their parents, the intentions of the students and their school success. With the cohort of 1993 the individualizing effect of comprehensive schools had increased and the differences between the schools had grown. Mäkinen (Ibid.) asserts that the educational policy that emphasized options was one reason for this trend.

Political decisions affect the individual's social system and they also affect the beliefs, values and attitudes of age cohorts. The values of school leavers in times of high employment vary from the values of the school leavers in times of high unemployment (Patton & McMahon 1999). Ahola et al. (1992, 98) report that education in 2000 does not match the population's educational wishes and preferences.

According to these researchers this will lead to 'tailback' in student flows, slow-down in applications to study places, dropping out and under-utilization of the available study places. The researcher's description of the future, which is today, has come true.

According to Bourdieu and Passeron (1990, 164) it may happen that an educational system is capable of veiling its social reproduction function behind its technical function of producing qualifications. In doing so the education system will not be able to answer the demand of the labor market. Kimweli (2004) has investigated the costs of career decision making. He argues that the exportation of jobs to cheap labor markets and the cost of training/education and diversity need to be considered in new career theories. The questions that must be answered are: "What are the costs and risks involved in career decisions and how do individuals and corporations (institutions and the government) factor these costs in decision to hire, fire, train and counsel current employees as well as prospective ones? What is the cost to the individual and to the nation when an employee who has been trained in particular fields choose a career in different field? What are the costs and benefits of such decisions?"

In Finland the cost and the risk of career decisions is estimated by the Finnish system of performance-based financing in vocational education and training, which was introduced in secondary vocational upper secondary education and training in 2003. The most important influence on the outcome-based funding of institutions is the degree of success in placing students in employment and further education (Niinikoski 2002). The importance of vocational education is emphasized in educational policies. However, this potential cannot be achieved if the educational system and institutions in the world-of-work and education do not co-operate.

Lehtisalo and Raivola (1999) assert that it is essential to connect work and education. Education policy has to build routes for signals from the labor market that reach students and affect their decisions. Education policy also needs to maintain a system in which educational institutions respond to the needs of economic life and the demand for students. External factors that affect education include politics, administration, interest groups, market forces, media and self-piloting of educational institutions. Lehtisalo and Raivola (Ibid. 216) have compared changes in the impact of these factors, which are presented in Table 15. The symbols in table are: '+' if the impact has decreased, '0' if the impact has no change or '-' if the impact has decreased.

The comparison shows that the impact of market forces, media and self-piloting of educational institutions is increasing at the turn of the century. According to Lehtisalo and Raivola (Ibid.) the effect of administration may increase over the next decade because of new education laws and an increased attention to evaluation. The perceptions of the researchers are that stakeholders at the institutional level are going to have more impact on education than macrolevel stakeholders.

Table 15. *Changes in the Field of Forces in Education (Lehtisalo & Raivola 1999, 216)*

External Factors That Affect Education	1980-90	1991-2000	2001-
Politics	0	-	-
Administration	+	+	-
Interest Groups	+	-	-
Market Forces	0	+	+
Media	0	+	+
Self-piloting	0	+	+

Ilomäki (2001, 232) considers the education system in secondary education between 2010 and 2015. He predicts that the secondary education structure will function according to the Education Acts 629 –631/98 until the year 2015. The secondary education structure is already functional and enables diverse learning. The change that has to be made by educational providers, institutions and teachers is for the educational system to become a more flexible versatile learning system in which teaching is seen as a support system, not as an end in itself. The reforms in education are a response to rapid changes in society. According to Raivola (2000, 172) only the implementation of these plans can lead to desired changes and the stakeholders on the local level have a profound effect on the success of the implementation of the plans. Pirttiniemi (2000, 39) also emphasizes that institutional procedures are significant elements in educational planning and engagement when the student has to make decisions about his or her future career while working life and education are both continuously changing.

3.3.4 Institutional Level Perspectives on Attractiveness

In vocational upper secondary education the attractiveness of educational fields can be measured for instance by the 'attractiveness index'. The attractiveness index is used to reveal the underutilization of resources and inefficiency of procedures. It also expresses the balance or imbalance of supply and demand of study places in vocational education. The attractiveness index is defined as the ratio between primary applicants and open study places in an educational sector or field. Attractiveness is poor when the ratio is lower than 1. Chapter 2 reports the attractiveness index of the machinery and metal technology program and other educational programs, which are investigated in this research. The attractiveness index is a measure for the first phase of the attractiveness process; that is, how vocational institutions have succeeded in attracting students into education.

In the United States there is a special model of schools called 'magnet schools'. Comerford (1981, 1) defines a magnet school as "a school that offers special cur-

riculum capable of attracting students of different racial and socio-economic backgrounds." Klauke (1988) describes the need for magnet schools to arise from the demands of a rapidly changing society and increasing pressure for desegregation. Parents, students and community members assess the needs of their school districts and design a specific program to serve these needs.

Comerford (1981) investigated the attractiveness from the parents' point of view in a High School for Creative and Performing Arts. The study concentrated on institutional level perspectives on attractiveness. The researcher identified six program factors intended to enhance the educational program that are linked to magnet schools: quality of the school staff, uniqueness of curriculum, an integrated student body, an integrated faculty, a relationship with nearby cultural institutions and the encouragement of parental involvement. Six non-program factors, which are not part of the education program but are still perceived as being important, were identified: ease of travel from home to school, safety in the school neighborhood, safety in the school building, size of the student body, dissatisfaction with the school the students would have attended otherwise and attractiveness of the school building. The most important items to parents were: uniqueness of curriculum, safety in the school building, safety in the school neighborhood and the quality of the school staff.

Comerford's study (Ibid.) contained elements that are not generally prevalent in Finnish society at this moment, for instance racial issues and the safety of school and the school neighborhood, although these issues are becoming more significant. However, the most important issues to parents were the curriculum and the quality of school staff, which should be of equal concern in Finland.

Career Counseling and the Changing World

Career counseling is the main way schools assist young people in their educational choices and career decision making (European Commission 1996). In the OECD education indicator project the attitudes and expectations of the general public towards education were investigated. Finnish data (Clarkson 1995) showed career counseling to be the third most factor enabling schools to reach their objectives. Approximately one third of the respondents felt career counseling to be an obligatory activity.

The QECD (2004) report on 'Career guidance and public policy' defines career counseling as follows:

> "Career counseling refers to services intended to assist people, at any age and at any point throughout their lives to make educational, training and occupational choices and to manage their careers. Career counseling helps people to reflect their ambitions, interests, qualifications and abilities. It helps them to understand education system and labor market and relate this to what they know about themselves. Career counseling makes information about the labor market and about educational systems more accessible by organizing it, systematizing it and making it available when and where people need it." *(OECD 2004, 19)*

Career counseling is also known as 'career guidance,' 'vocational guidance,' 'vocational counseling,' 'information, advice and guidance' and 'career development.' The latter term—career development—is widely used in the research literature in the United States today, while European literature prefers the term career guidance and career counseling. The terms characterize the meaning we give to the counseling practices. In the research literature in the United States the debate has been about the convergence of career choice and development theories while in Finnish research literature the focus has often been in the interaction of the student and the counselor.

In guidance and counseling literature four different types of 'guidance' are distinguished:

1. Educational guidance: the development of learning process in educational establishments, support for choosing educational options, and learner support.

2. Vocational guidance: the transition between the different levels of the educational system, the decision making process and career choices; support in the choice of, and placement into, occupations and work roles.

3. Occupational guidance: entry into the labor force.

4. Personal guidance: support for personal and social issues that can affect the development of the individual. *(adapting de Faletty & Del Compare 2002; Van Esbroeck & Watts 1998)*

The variety of terms reveals these aspects of guidance to be separate fields without interaction. Undoubtedly the new world of work will need a holistic guidance model (Van Esbroek & Watts 1988).

In the Finnish language the terms '*ammatinvalinnan ohjaus'* (vocational guidance), *'opinto-ohjaus'* (educational guidance and counseling), *'oppilaan ohjaus'* (student counseling), *'opintojen ohjaus*' (study counseling) are used. The term *'uraohjaus'* (career guidance/career counseling) refers to the lifelong counseling of the career, but still relates to the historical aspect of the term as lifelong careers. The ambiguous terms may even induce problems in cooperation among various stakeholders (Opetusministeriö 2004b, 7). Apparently we need new terminology and new theories to promote new practices.

Career counseling services for students are available at comprehensive schools, vocational institutions and labor exchange offices. Career counseling services in labor exchange offices are primarily intended for older clients. In the year 2000 only 23% of those receiving counseling were 15-19 years old. (Pulliainen 2000, 92.) In the year 2002 only 10% were from comprehensive schools or upper secondary schools (Työministeriö 2003b).

A portion of the indicators for secondary education in Finland were derived from the provision of career counseling in upper secondary education and vocational education. The indicators investigated by Kangasniemi (2003, 87) show that

career counseling activities do not meet the needs of all students, either in general or vocational upper secondary education. The most noteworthy aspect is that the curriculum does not provide lessons for career counseling at every school and the subject teachers do not take part in career counseling activities (Ibid.). In the joint phase of comprehensive school and vocational upper secondary education and training, counseling should be effective, competent, and accomplished in cooperation in both institutions. At the beginning of vocational studies the main focus of career counseling is to encourage the student in his or her studies. This serves to prevent the threat of interruption of studies beforehand. (Pirttiniemi & Päivänsalo 2001.)

The European Commission Report (1996), which discusses the problems of vocational education and training in EU Member States, shows the lack of sufficient counseling in the entry phase to vocational education. Changes in work and occupations, the disappearance of old careers and the competence profiles required for new occupations challenge counselors to develop their work. The development activities that are supposed to impact counseling are the renewal of counseling processes and the acquaintance of teachers in comprehensive schools with working life.

Feller (2003) asserts that changes in job structure, family norms and an increasingly technological society require new career-planning competencies that promote rewarding careers. Counselors act as facilitators for the career development of individuals. Patton and McMahon (1999) explain the term career development facilitator in terms of the support of lifelong processes of career development. Under changing labor market conditions the only reliable foundation for career development is the person's own values, needs and interests (Kurtelius 2002, 101).

Career counseling services are required to react to changes in society: economic changes, changes in employment patterns and increasing globalization (Lairio & Puukari 1999b; Patton & McMahon 1999; Peavy 2000; Savickas 2003; Tang 2003; Vuorinen & Välijärvi 1994). The career services have to encompass the changing external environment. Numminen (2003, 6) asserts that changes in educational guidance and counseling are required as a result of changes in society and working life, as well as changes in the educational system itself—particularly the flexibility of the school system, new models of learning and new learning environments.

Numminen et al. (2002) and Numminen (2003) have assessed the state of educational guidance in Finland. The evaluation design included several different perspectives on career guidance and counseling. The perspectives were those of the pupil/student, the study counselor, the principal, the education provider and the parents. The main focus of the assessment was the availability and role of guidance when the students are passing from the sixth year group class to the seventh year group class in basic education, from basic education to upper secondary schools and to vocational education, from basic education to the labor market and to further studies. The shift to general upper secondary education and to vocational upper secondary education is supported through educational guidance in the upper level classes. The evaluation indicates that in basic education the students were encouraged to apply for a study place in general upper secondary education.

However, the aforementioned evaluation does not go far enough in examining the wider context outside of educational institutions. We should also take into consideration the world of work when evaluating the actions of educational institutions. Lehtisalo & Raivola (1999, 38) emphasize the primary purpose of education, which is its economic role in training the labor force to meet the needs of business life and to prepare individuals to earn their living.

The requirements for change and development of old viewpoints applies to counseling personnel and teachers, as well as the administrators, in educational institutions at every educational level. Pirttiniemi (2000) points out that the role of teachers in counseling and supporting students should be increased. This would help the students to get more personal guidance and to feel that they are respected. Numminen (2003, 25) points out that the curriculum guidelines define guidance and counseling as a task belonging to all teachers. However, the study counselors bear the main responsibility for designing the services even if others assist in carrying them out.

Teachers are often left out of the discussion of career choices. Mäkinen (1998, 84) asserts that teachers and career counselors act as representatives of the social education system and they are responsible for matching the wishes and interests of young pupils and the demands of workforce. Stenström (1988, 21) also points out the responsibility of teachers for guiding students in their career choices. The opinions of teachers, however, seem to differ. The responsibility for career counseling in vocational institutions has often been given only to career counselors. Every person working at a vocational institution should take responsibility for promoting the students' studies, professional development and welfare. This also supports the objectives of the institutions. (Seinä 2002.)

Lairio and Puukari have significantly developed and investigated career counseling in Finland. The researchers consider the theoretical basis for counseling to lie in counseling and psychotherapy (Lairio & Puukari 2001). The framework for career development and the wider context is, however, missing in their recent studies. Their research concentrates on the interaction between the counselor and the individual student. The convergence and integration of career development theories has not been discussed in Finnish counseling literature to the same extent that it has been a central subject of research and debate in the international literature.

Career counselors have chosen, consciously or unconsciously, counseling theories to guide their practices. A study by Söyring (2004) shows how the expected societal outcomes of a career counseling development project in athletics failed to be realized. The counselor had chosen to take into practice theories that called for attention only to the individualized customer himself, and not to the environmental societal system or the world-of-work.

In a recent European research project, career counseling was described as having three goals: learning goals, labor market goals and social equity goals. The learning goals of career counseling were to contribute human resources as a way to improve the efficiency of the education system, to improve the fit between education and the labor market and to assist the internationalization of education. Labor market goals were to contribute to certain labor market policy objectives; for example by improving labor mobility and supporting the ability of the labor market to

adjust to change. The social equity goals emphasize supporting the disadvantaged and addressing gender equity. (OECD 2004.)

In Denmark (European Commission 1996) the following development activities of career counseling have been demonstrated: students and their parents are informed about the labor market; the careers of graduated students are followed; the opinions of employers about the qualifications of the graduated are collected; the content of curricula is evaluated by graduated students and the comprehension of teachers in vocational institutions about counseling are investigated.

Saarinen (1998) describes practices that can be used to impact the educational and career choices of young pupils: bring out new information, bring out new possibilities, familiarize the students with working life, make the selection phase more realistically focused, present technical education fields, present industrial work, arrange for students to meet with persons working in industry, make subjects at school more relevant to society and the world of work, employ real world scenarios. The abovementioned practices have to be as concrete and personal as possible (Ibid. 101).

The cooperative committee of guidance counseling and employment services (Opetusministeriö 2004b, 7) focuses on four central development themes. These are: "stepping up guidance in transitional stages; speeding up the youth's placement in education or work and diminishing dropping out in education; developing actions to promote prevention of exclusion of youth; developing cooperation between education and labor administration and diffusing good practices. "

The working group (Ibid.) emphasizes that transitional stages are points on the educational path of youth where the functionality of guidance services is measured. In these stages, cooperation are needed between educational institutions and between representatives of various administrative fields.

The aforementioned actions require cooperative activities and good relationships between educational institutions and working life. Furthermore, various aspects of information and knowledge—for example, colleting data, analyzing data and the means for creating, collating and distributing the knowledge that results—are fundamental to the improvement of career counseling and career development.

Compulsion of Career Information and Educational Information

Information about the self, education and training opportunities, as well as information about occupations and their changes and characteristics is very important foundation for career choices and development (Brown 2003). Korhonen (1997) asserts that young pupils criticize career counseling in the following ways: the information is insufficient, the career counselors are not able to explain the significance of the educational choices and the given information emphasizes either the upper secondary or the vocational path. Information about educational possibilities and choices is the essential first step to opening the pathway to vocational education. In the overall evaluation of the machinery and metal technology field Räisänen et al. (1999) found that only 15 % of the students felt they had received sufficient information about the educational program in the application phase.

Ertelt and Seidel (1998) have studied the information required for individual career decisions. They found four required factors to the information.

Factor 1: represents criteria information to assess occupational alternatives: advantages and disadvantages of certain occupations, opportunities and risks of certain occupation on labor market and where are the own occupational strengths.

Factor 2: contains the desire for information for definition of own occupational problem situation, for further steps to be taken and possible obstacles in training and professional activity.

Factor 3: covers the desire for information on occupational flexibility, mobility and corresponding aids from the Labour Office.

Factor 4: bundies information wishes relating to confirmation of decision and its implementation. *(Ertelt & Seidel 1998, 328)*

Guidance information must also be placed into a real world context that addresses the student's immediate questions. According to Vuorinen and Välijärvi (1994, 79), for example, the essential contents of information for pupils in comprehensive schools are:

> "what does it mean to be non-graded; what are the objectives of non-graded schools and why did the system change to this format; what is the qualification structure in secondary education; what are the options that are available and what do the choices mean to the future of the student; what is the selection system in secondary education and what are the selection criteria; what flexibility is possible in terms of education time; what does it mean in practice; what is an optional school schedule; what applied and specialized studies are available; what does it mean to study upper secondary courses or vocational courses in other institutions and what are the possibilities for carrying out part of the studies abroad?" *(Vuorinen & Välijärvi 1994, 79)*

The list of questions above is rather extensive for career counselors to answer alone. Fortunately, young people have several other sources of information. Saarela (2002, 13) has investigated sources of information about educational possibilities after comprehensive school. The most common information source was friends (83%), eighty-two percent of the students considered that they got information from the career counselors to a great extent or to some extent. The third group was teachers (72%). Forty-five percent of the young people sought their educational information from the Internet. Somewhat different results have also been presented. Internet is the most used source for industrial occupational information (64%), the second source is newspapers (64%), the third source is radio and TV (59%) and the fourth source of information is the school (50%). (Taloudellinen tiedotustoimisto 2003.)

In the last decade new information and communication technologies (ICT) have been used to provide career information and guidance services. Today ICT-based

career information systems often replace the paper-based systems. The development of career information delivery systems is essential to modern career guidance (Patton & McMahon 1999), although the expansion of their use should be accompanied by the development of career counseling practices themselves. (OECD 2004.)

Several ICT-based occupational choice and guidance environments are used in schools. These provide tests and information about occupational choice, occupations, work placement etc. The number of ICT-based counseling services is increasing. The Ministry of Labor counseling service (www.mol.fi/avo) contains information about 300 occupations, education and training. It is also possible to evaluate one's own interest and capabilities. The other Internet service from the Ministry of Labour is (http://www.mol.fi/webammatti.cgi), the database of occupations. Opintoluotsi (www.opintoluotsi.fi) is a site for information for Finnish and foreign students about education and training in Finland. The Opintoluotsi service provides comprehensive link-lists for various occupations, education possibilities and working life.

New technologies and approaches require career counselors to learn new skills and to work in new ways (Sweet 2001). According to Lairio and Puukari (1999, 83), the new career counseling programs are not yet used extensively but their use is expanding. Numminen (2003, 23) points out that only half of Finnish career counselors feel they have the knowledge and skills to use ICT in their activities.

Brown (2003, 197) has compared various types of occupational information. The comparison is presented in Table 16. Brown asserts that information about education and training opportunities and occupational information should be considered separately. In Finland occupational information is presented separately from educational information. The problem is rather how to combine these information sources in a way that will provide the student with the information necessary for his or her education and career decision making.

The table lists pros and cons for numerous methods of delivering occupational information. Which approach is best depends on resources, accessibility and the level of learner involvement that is desired. One difficulty in selecting the best way to provide information in any particular case may be in the numerous sub-types of delivery that are possible.

Table 16. *Pros and Cons of Types of Occupational Information (Brown 2003, 197)*

Subtype	Cost	Learner Involvement	Accessibility
1. Print	Inexpensive	Passive	Easy
2. Programmed	Inexpensive	Interactive	Limited
3. Audiovisual	Expensive	Passive	Limited
4. CACGS***	Moderate to expensive	Interactive	Limited
5. Online Systems	Inexpensive	Passive	Limited*
6. Simulations	Inexpensive	Interactive	Limited
7. Games	Inexpensive	Interactive	Limited
8. Laboratories	Expensive	Interactive	Very limited
9. Interviews	Inexpensive	Interactive	Limited
10. Observation	Expensive	Passive	Limited**
11. Work Samples	Expensive	Interactive	Limited**
12. Job Tryouts	Expensive	Interactive	Limited**

* Easy if computer and Internet connections available

** Very limited in rural areas

*** CACGS - Computer assisted career guidance systems

In order to respond to changes in the labor market, career counselors also need information. Okkeri (2000, 35) asserts that in most forecast analysis and projects the perspective of career and student counseling is missing. The analysis ought to be translated into the language of the counselors. Also the counselors ought to be taught how to read diagrams and tables so that they can interpret data that is in this form to students. Assistance in interpretation of forecast data should also be available to parents, students and even educational decision-makers.

World-of-Education Apart From World-of-Work

Educational institutions are economic, political and administrative units that have strong links to, and must act in close cooperation with, other institutions (Raivola 2000, 6). The structure of national employer and employee interest groups and the quality of labor market relations affect the involvement of the labor market in vocational training. The participation of employers in the vocational education and training is receiving more priority in EU Member States (Koch & Reuling 1998). Nonetheless, Patton and McMahon (1999, 208) assert that terms like 'school-to-work transition' reveal a rift between the two systems. In Finnish, the term *'nivel-vaihe'* (transition point) has been used to describe the transition from comprehensive school to upper secondary level education.

Luukkainen (2004) claims that changes in society have created a new horizon for teachers and schools. This requires changes in the role of "teachership", which is the key component in changing the schools. In the future, teachers will have to

play a more active role in developing society, which requires societal orientation, future orientation, cooperation and continuous learning. Related aspects have arisen in the research concerning future technologies and qualifications. Ahlqvist (2003b) advocates the introduction of knowledge of society, development of science and environmental issues to traditional education.

Naumanen and Silvennoinen (1996, 157) point out that the role of teachers in cooperation with companies. One of their interviewees opined that: "Teachers think that they are outside all kinds of systems. I think that they belong inside the ball, not circling around the outer edge." Students are eager to discuss the world-of-work at school, which has often been a surprise for their teachers (Siikaniemi 2000). This might have some connection to the fact that career counselors seem to be the only people in schools interested in career development (Patton and McMahon 1999, 216).

A great deal of the cooperation between education and working life in vocational institutions and comprehensive schools is accomplished with partner companies. Examples of these cooperation areas are: career counseling lectures and other lessons, working life familiarizing (TET periods), company visits, parents' meetings and other occasions, optional courses, summer jobs, students at vocational institutions and their on-the-job-learning, individual or small group guidance for those who are interested in special branch or occupation, various cooperative projects, apprentice, and long-term partnerships during education and at the beginning of working life. (Korhonen 1997; Saarinen 1998.)

In Finland the first contacts between school and the world-of-work occur in the 7th grade in comprehensive schools, when familiarization activities take place during TET periods. In the 7th grade 41 % of the pupils are introduced to working life in a single day program, while 36% of the pupils did not have even this brief opportunity. In the 8th grade, the orientation period lasted for five days for 45 % of the pupils and in the 9th grade 68% of the pupils visited a work site for six to ten days. In general upper secondary schools the students are introduced to working life for 1-2 days. The most common forms of cooperation were visits to companies (60%) and visits to schools (34%). (Lairio & Puukari 1999a, 90-92.) In their research Lairio and Puukari found that single day visits to work sites are not effective in making a significant connection, and recommend that cooperation should be coordinated to give the pupils a more holistic view of the world-of-work.

In most schools the pupils themselves must find their TET places. A career counselor helps the pupils that do not succeed in contacting companies. Especially when pupils seek the TET place themselves they often turn to the easiest alternative. For girls, these easy placements are: kindergartens, offices and other typical female occupations. There is a clear need for them to visit not-so-familiar working places, which should be arranged by the school staff. (Saarinen 1998, 105.)

The study of indicators of secondary education in Finland describes the current state of working life relationships of the institutions (Kangasniemi 2003). These indicators show that 31.5% of vocational institutions did not arrange on-the-job-learning during the first year. Approximately twenty percent of the institutions arranged on-the-job-learning periods for four credits (22.3%). On-the-job-learning periods were typically deferred to the third study year and the periods varied from

eight credits up to fifty credits. Typically no other opportunities for working experience were arranged. Seventy-three percent of the institutions arranged only on-the-job-learning. Some of the students worked with the school staff and some had the opportunity to work in a company associated with the school. These offered possibilities to work in a school's shop, cafeteria, dining room, construction project etc. Four point seven percent of the vocational institutions never invited representatives from working life to give lectures at the school (41.1% often, 54.3% sometimes) and 3.9% of the schools never visited work sites off campus (60.5% often, 35.7% sometimes). In general upper secondary education there were even fewer opportunities.

On-the-job learning is assumed to increase the attraction of education (National Board of Education 1999, 14). On-the-job learning is one means of promoting the interaction of educational institutions and working life and it also has several other general aims. Pohjonen (2002, 10), however, asks rightly: "is the on-the-job learning a solution to the problems of education?" Are there too many reform-oriented aims, which cannot be realized?

The main criticism of vocational education in Finland offered by those in the working world is that there is insufficient interaction with them. A Ministry of Labor study shows that 47% of representatives of the industrial sector find their interaction with vocational institutions to be insufficient Without ongoing interaction educational professionals do not have an up-to-date picture of the world-of-work and the structure and content of educational programs is liable to remain disconnected and become increasingly obsolete. However, representatives of companies admit that they could also be more active in making contact with educational institutions. (Naumanen & Silvennoinen 1996.) Representatives from both companies and educational institutes admit that their interaction is insufficient, but both sides claim that the other partner is too passive to promote their cooperation (Naumanen & Silvennoinen 1966; Kulmala 1998).

Corfield (1991) describes the education system as closed loop in which teachers are persons who have finished their schooling, continued their studies in universities and returned to schools to work as teachers. Therefore, he suggests that teachers should be required to have some work experience outside the school system before they begin their teaching career so that they will have personal experience and contacts that will enrich their teaching and make it more relevant to the world-of-work.

During the last decade several projects and development programs have been designed to strengthen and enrich the interaction of educational institutions and working life by tackling problems such as the fact that most teachers have no competence, motivation or volition to cooperate with those in the world-of-work; there is a lack of time and resources; or there are limited opportunities for interaction within the regional economic economy. The themes that have been found to foster cooperation are: the volition of teachers to develop education; new structures of qualification systems; apprenticeship training and the interest of companies to develop their own competitiveness. (Siikaniemi 1998.)

Lasonen and Manning (1999, 39) present a comparison of various forms of relationship between the education system and the labor market. Their typology contains three types of relationships: 1. Close relationship (a tracked system of

tains three types of relationships: 1. Close relationship (a tracked system of education and qualification structure which has direct relevance for occupational entry), 2. Loose relationship (a flexible match between qualifications and occupations), and 3. Varied relationship (a close matching confined to apprenticeship or specialized VET (Vocational Education and Training) and loose matching related to predominant full-time education). In Finland relationships are generally of this latter variety—varied relationship.

The relationship types presented by Lasonen and Manning (Ibid.) do not seem to probe sufficiently into the context levels of education and labor market cooperation. The functional structure at different context and operation levels should be defined and the research should involve the various stakeholder groups and the activities, as well as measures and indicators on each level. Blumer (1969, 19) asserts that a network or an institution does not function automatically, because of some inner dynamics or system requirements. It functions because people at different points are active and their activities are a result of how they define the situations in which they are acting. The process of interaction consists of indications to others of what to do and interpretations of the indicators exhibited by others (Ibid. 20). The process of interaction is similar among the stakeholders on all context levels—microlevel, institutional level and macrolevel.

3.3.5 Microlevel Perspectives on Attractiveness

Affect of Socio-Economic Background of Students on Their Educational Choices

The socio-economic status of an individual can be examined from both contextual and individual perspectives. The influence of socio-economic status was discussed earlier in this chapter (Section 3.1.3 under 'Contextual Approaches'). This section looked at the effect of socio-economic background on educational choices from an individual perspective; that is, a microlevel perspective.

A large number of studies approach educational choices from the perspective of the socio-economic background of the students. Several studies find that the socio-economic background of the students has a significant influence on their educational choices (Kasurinen 2000: Lehtisalo & Raivola 1999; Mäkinen 2000; Nevala 2000; Savolainen 2001). Kivinen et al. (1989, 149) assert that education cannot remove an inequality that is anchored elsewhere in society. Also, the individuals have different backgrounds and preferences. That is why the education system has to offer individual education pathways without dead ends.

In 1985 the children of blue collar and agricultural workers chose their study places mainly in vocational institutions. However, their educational fields differed considerably from each other. The children of blue collar parents sought out industrial occupations. The aim of the children of blue collar and agricultural families was to move as soon as possible from education to working life. The children of administrative and clerical employees stayed in the education system longer and they aimed as high as possible. Gender, native language, province, municipality

and even the number of siblings also affected the educational choices of different population groups. (Isoaho et al. 1990, 6.)

In 1995 the socio-economic status of parents and the educational choices of children were still found to have a strong connection. Thirty-nine percent of the children of families in which the father had comprehensive school education sought vocational upper secondary education. For the children of fathers with university degrees the number was 11%. (Havén 1998.)

Käyhkö and Tuupainen (1996) have studied the effects of family, educational institutions and free time on the actions and choices of young people with a blue collar background. The researchers found that the parents in blue collar families did not direct their children in their educational choices as much as the white collar families, in which the parents had prospects and expectations for the educational choices of their children. The researchers also showed that parents often had a lack of knowledge about education.

Evaluation reports of career counseling (Numminen et al. 2002; Numminen 2003) show that there is an evident inequality between general upper secondary education and vocational upper secondary education. Career counselors, and also parents, were better informed about general upper secondary education than about vocational upper secondary education and training. The students wanted to have more information about the labor market and vocations. The students got information about vocational certifications, but the nature of the vocations and the tasks involved in them remained incomprehensible.

According to Nevala (2000), educational equality has improved in Finland. The basis for this development is in simultaneous active expansion of both vocational upper secondary education and training and higher education. Nevala (Ibid.) asserts that the earlier a young person makes his or her choices the greater is the influence of the cultural and socio-economic background of the family.

Saikkonen (2000) has investigated the affects of social background on education level achieved with cohorts born in the years 1956-75. This research, which is based on statistical data for 146,734 persons shows that the socio-economic status of the family affects education level of children. The differences, however, diminished with higher education graduates of cohorts born in the years 1956-60 and 1961-65. This result differs from the results of studies by Kivinen and Rinne (1995). The differences were partly explained by different research methods.

Regional differences in graduation rates from general upper secondary schools decreased at the end of the 1970's but the difference grew again at the end of the 1980's and the beginning of the 1990's. Young people in cities graduate more often from general upper secondary schools and universities that young people from rural areas. (Saikkonen 2000.)

Antikainen (2000) and Kivinen et al. (2000) discuss the affects of socio-cultural and socio- economic background on the educational choices of higher education students. Kivinen et al. claim that educational equality has not yet been realized in Finland. However, Antikainen points out that the differences have narrowed and that educational inequality has its anchors in families and the labor market**.** Additionally, equality or inequality is anchored to the interaction of residential areas and other societies as well as the structures that support and restrain social contribution

(Antikainen 2000, 65). The debate indicates that the concepts of, and research methods for determining, educational equality and selection have not yet been agreed upon.

Today every pupil who has completed a comprehensive school education has access to a study place in secondary education and the opportunity for further education. Consequently, in the future social background will have little impact on educational choices and career opportunities for young people (Jokinen 1988; Lehtisalo & Raivola 1999).

According to Whiston and Keller (2004) the two interdependent family contextual factors are family structure variables and family process factors. Finnish research into family and career development linkages has concentrated on the socio-economic status of the families and the parents' occupational status, that is, family structure variables. Family member are involved both directly and indirectly in career decisions and family process factors. For example, parent and sibling relationships affect career decision making. However, research into the role of parent-child relations is insufficient. The current contextualized view has directed attention to the relationships and relational context in career development (Blustein 2004; Phillips et al. 2001; Whiston & Keller 2004).

Socio-economic status cannot be changed by short-term performance. Thus, if the attractiveness of education has to change sufficiently rapidly to keep pace with labor market changes and demands, other factors have to be considered. Educational research needs to find explanatory factors and solutions from other individual and contextual sources.

Gender Stratification and Gender Inequity in Vocational Upper Secondary Education

Gender has affected the educational choices of the Finnish youth for over fifty years. In the 1950's some vocational institutions specialized in what were considered to be men's occupations and others in women's occupations. Machinery and metal technology, as well as woodwork education and training, were intended for boys while sewing and household education and training were seen as occupations for girls. (Mattlar 1954.) These old traditions still dominate educational and career choices.

Stenström (1995) points out that vocational education often follows the same gender segregated patterns as the labor force and that there are gender differences in vocational education and occupational choices. Also, Nummenmaa (1991, 35) points out that educational structure is differentiated into girls' and boys' educational fields just like occupational structure and that vocational education reinforces and propagates the stereotypes in working life rather than reducing them.

Table 17 shows trends in the choices of education by gender in traditionally male fields (91-100 % men), male dominant fields (61-90%), mixed fields (41-60%), female dominated fields (61-90% women) and traditionally female fields (91-100%). These trends are taken from statistics for the years 1975 and 1995 (Havén 1998). The educational fields investigated in this research were: motor ve-

hicles and transport; machinery and metal technology; electrical engineering; heating, plumbing and ventilation; youth and leisure instruction; hotel and catering; health care and social services.

The statistics show that the changes between the years 1975 and 1995 have been minor in traditionally male fields, and the percentage of women in machinery and metal technology has decreased from 3.2% to 1.7%. In female dominated fields and traditionally female fields the percentage of men has increased. The largest change is in hotel and catering field, where the percentage of men has increased by 11.8 %. (Ibid.)

Statistics for the year 2002 have not been compiled according to educational fields as have previous statistics. Nonetheless, the division into men's educational sectors and female's educational sectors is still evident. The number of new students entering vocational upper secondary education and training and vocational further education and training that year was 74,222. The number of women was 38,074. In the technology and transport sector 24,788 (83.8%) of the new students were male and 4,008 (16.2%) of the new students were female. In the health care and social services sector 10,819 (89.3%) of the new students were female and 1,300 (10.7%) were male. (Tilastokeskus 2004b.)

These comparisons should be considered to be a trend because the structures, classifications and items of vocational education have changed. Even the numbers in the years 1975 and 1995 cannot be considered directly comparable.

Girls enter non-traditional fields more often than boys (Lairio & Puukari 2001). The researchers suggest four factors that restrain non-traditional choices. These factors are: the conservativeness of parents and their lack of knowledge about current educational and career choices; the conservativeness of teachers, their inattention and excessive expectations of students pursuing non-traditional fields; the impact of peer group and media and insufficient time for career counseling (Ibid. 115). According to Käyhkö and Tuupainen (1996) girls do not think that they have failed or that they had no other choice than vocational education. Girls consider vocational upper secondary education to give them an opportunity to express oneself and develop creativeness. The boys in vocational upper secondary education expect to achieve a higher standard of living through education and they also want to enter a masculine occupation.

The number of female students in the machinery and metal technology field is extremely low. In 1995 girls only accounted for 1.7% (Havèn 1998). In the evaluation of the machinery and metal technology field no significant impediments for female students were found. Moreover, teachers had positive experiences with female students, who were considered motivated and successful. Approximately one-third of teachers stated that no special efforts had been made to recruit female students to technical fields. (Räisänen et al. 1999.)

Table 17. *Choices of Vocational Education by Gender in Finland in years 1975 and 1995 (Havén 1998)*

Gender Fields	1975	1995
Men's Fields (91-100%)	Motor vehicles and transport *99.5 m/0.5 f* Machinery and metal technology *96.8/3.2* Electrical engineering *96.7/3.3* Heating, plumbing and ventilation *95.7/4.3*	Heating, plumbing and ventilation *99.7 m/0.3 f* Machinery and metal technology *98.3/1.7* Electrical engineering *96.7/3.3* Motor vehicles and transport *95.6/4.4*
Male-Dominated (61-90%)		
Mixed (41-60%)		
Female-Dominated (61-90%)	Youth and leisure instruction *27.4 m/72.6 f* Hotel and catering *20.2/79.8*	Youth and leisure instruction *31.3 m/68.6 f* Hotel and catering *32.0/68.0* Health care and social services *11.8/88.2*
Women's Fields (91-100%)	Health care and social services *6.9/93.1*	

Juutilainen (2003, 212) claims that the gender of the counselor has very little effect on topic segments or other processes in counseling conversations in Finnish upper secondary schools. However, the student's gender has a great impact on the thematic progression of the counseling conversation and on the student's life situation. The gender constructs of career counselors renovate and deconstruct gender systems and socially based gender identity.

3.4 Standing of Vocational Upper Secondary Education and Training

3.4.1 Vocational Education Versus General Education

The relationship between educational field and attractiveness is described in the definition of attractiveness, which was used at the beginning of this report.

Vocational upper secondary education and training is competing with general upper secondary education. Prior research has emphasized the esteem or standing of vocational education compared to general education. The esteem of education can be examined from individual, company and society perspectives. Parikka

(1999) suggests that at the individual level the foundation for occupational status are employment opportunities, wages and on the other hand competence and professional skills. At the company level vocational education is esteemed when it is capable of producing a skilled labor force that the company can employ without long orientation phases. Society esteems vocational as well as other education because of the favorable image and international competitiveness of the nation.

The esteem of vocational education can be measured using national, regional and schools' own statistical data. Poropudas and Kyrö (1999, 183) propose the following four sources of assessment data for the esteem of vocational education: student database information of the changes in the application of the young persons, an attitude analysis of citizens, information describing the activities of the labor market and international reference data. The international comparison shows that the esteem of vocational education is poor in Finland compared, for example, to Germany and the Czech Republic. In the Czech Republic 80% of young students choose vocational education, while in Finland the corresponding number is 55%. Poropudas and Kyrö (Ibid.) claim that the only solution to increase the esteem of vocational upper secondary education is to decrease the proportional supply of vocational education. This can be done only if the anticipation of regional education needs is implemented and utilized on the basis of national and regional educational decision making.

The European Commission has promoted a Leonardo da Vinci program Post–16 Strategies project. The project analyzed upper secondary school reforms in European countries and their effect on the attractiveness of vocational upper secondary education and training. Young and Raffe (1998, 37) identified four strategies that will promote the parity of esteem of general upper secondary education and vocational upper secondary education and training. The strategies are:

- Vocational enhancement: to enhance vocational education,, and make it more attractive to potential students, through measures which maintain and strengthen its distinctive ethos and its separateness from general education.

- Mutual enrichment: to enhance both vocational and general education through measures which allow each to draw on the best features of the other, a strategy that brings the two types of education closer each other but maintains a distinct identity for each.

- Linkages: to give vocational and general education the same formal status, and to link them through such measures as a common certification framework, arrangements for recognition and transfer and common curricula elements; and

- Unification: to abolish the distinction between vocational end general education by combining them within a unified system and developing a curriculum which integrates the two. *(Young & Raffe 1998, 37)*

Finland has chosen the mutual enrichment strategy. This produces changes over a long time period, which might not be sufficient, because changes in economic life

require rapid response and actions to meet labor market demands. Volanen (1995) points out that in many European countries efforts have been made through several experiments and development programs to provide mutual enrichment for academic and vocational education. Three main approaches have been used: modularization, integration and mutual enrichment of general and vocational upper secondary education.

Lasonen and Manning (1999, 5) assert that the issue of 'the standing' of vocational education in Europe is addressed in different educational contexts: In Finland the gap between general and vocational education has led to integrating curricula within personal study programs. In Germany the demand by young people to access higher education has resulted in pressure to construct equivalent pathways. In Portugal the demand by industry for highly skilled workforce has caused reforms to raise standards of vocational education to create equal status with general education. In the study by Lasonen and Manning (Ibid.) the standing of vocational education in comparison to general education has been considered at three levels of analysis: courses and curriculum, the education system and the labor market. The approach to comparative analysis is presented in Table 18.

Table 18. *The Standing of Vocational Against General Education: Approach to Comparative Analysis (Lasonen & Manning 1999, 5)*

Level of Analysis	Criterion of 'Standing'	Framework of 'Standing'
1. Course/Curriculum	Development of personal competence, including occupational skills.	Social value of vocational as against general training.
2. Education System	Chance of educational mobility and progression in lifelong learning.	Choice between pathways; selection for university access.
3. Labor Market	Prospect of employment and occupational mobility.	Competition between all qualifications at job entry.

Table 19 presents measures and indicators of the standing of vocational against general education. The individual projects reviewed in the study (Lasonen& Manning 1999,6) relate to most of the measures and indicators. The measures and indicators had varying emphasis, which depends on the different national contexts. The course/curriculum level aims at integrating general and vocational education in subjects and curriculum. Today the student can choose courses in general uppers secondary and vocational upper secondary education. The education system level measures aim at vertical and horizontal mobility of students in vocational upper secondary education and training. The Education Acts 629-631/1998 gave equal opportunities for students graduating from vocational upper secondary education to continue their studies at a higher level. The enrichment of the attractiveness of education resulted in a notable increase in flexible education experiments and youth school experiments (Ilomäki 2001). The labor market level measures aim at strengthening cooperation between companies and educational institutions. Undoubtedly this has a significant impact on the attractiveness of vocational educa-

tion. However, the presented measures may be too conventional. If the measures are expected to be efficient, more accurate research is needed.

However, the study by Lasonen and Manning (1999) does not go far enough, it has concentrated primarily on macrolevel factors of career choice and development. There was no linkage to the individual who brings the institutions and their standing into the field of his or her choices and then makes the final decision. Lasonen (1999b, 29) states that "the improvement of the status of vocational education compared to general education is a permanent objective that can only be reached by continuously developing vocational upper secondary education and training and adapting it to new requirements." The improvement of vocational upper secondary education and training appears to be too limited, because one stakeholder group cannot solve the extensive problem alone.

Table 19. *The Standing of Vocational as Against General Education: Measures and Indicators (Lasonen& Manning 1999,6)*

Measure Expected to Improve 'Standing'	Indicator of 'Standing'
Course/Curriculum (1)	
Combining vocational and general education (integrative courses/curricula).	Integration of general and vocational subjects in curriculum.
Including key competences in the curricula: establishing new quality of VET (vocational education and training) as alternative to general education.	Role of key competencies in the curriculum.
Education System (2)	
Regulations ensuring lateral mobility including acknowledgement of course results.	Vertical and horizontal mobility of VET students.
Stipulation of equivalence of upper secondary certificates with regard to higher education.	Access to higher education for VET graduates and success in course study.
Provision of qualifications with a dual orientation toward employment and higher education.	Proportion of relevant age group acquiring dual qualification.
Promoting connectivity, including linkages, within upper secondary education.	Mobility of students between vocational and general strands.
Labor Market (3)	
Cooperation between educational institutions and enterprises/organizations facilitating transfer fro vocational training to labor market.	Practical assignments, apprenticeships.
Provision of qualifications with dual orientation towards employment and higher education.	Employment rate of graduates; level of initial job entry of graduates.

Mäkinen and Volanen (1996) found the following causes for the low attractiveness of vocational upper secondary education and training. Firstly, compared to general education, vocational education does not offer a sufficient formal competence and qualification. Secondly, vocational institutions may not give students the same employment possibilities as higher education. According to the researchers

the employment prospects for vocational education, their career opportunities and their potential incomes are poor.

The flexible education system of upper secondary vocational education is considered to be an essential part of its image. However, there are deficiencies: the systems are too rigid to accept different students, the curricula are not renewed fast enough according to the requirements of the industry. (European Commission 1996.) The study of a flexible education structure experiment and its effects on the attractiveness of vocational education in technology sector show that in the beginning of the experimentation the flexible education structure has increased the attractiveness because of the improved opportunities to pursue further education (Rauhala 1994).

Earlier research into the standing of vocational upper secondary education has concentrated on structures, systems and wide frameworks. Research into institutions and local stakeholders needs more consideration.

3.4.2 Technology and Transport Sector Versus Other Sectors in Vocational Upper Secondary Education

The low status of technical vocational education is a problem in every EU Member State. This problem is explained several ways. According to a German research, parents and young people do not consider general education and vocational education equally attractive. Vocational education produces good employment possibilities but poor social status. Teachers in comprehensive schools direct their students to higher education. (European Commission 1996, 29.)

The lack of attractiveness in the technology sector of vocational upper secondary education and training was already noted in the 80's. Punkari (1990) claimed that a large number of students who were seeking educational pathways to the technology sector were unmotivated, which was due to the low attractiveness of the technology and transport sector in vocational upper secondary education. Punkari also brought up other factors that led to the lack of attractiveness of technical vocational: the education and training is too schoollike in vocational institutions, the theory emphasis of general studies, growing educational provision and its affect on the competition between various educational sectors, diminishing generations and the negative image of industrial occupations (Ibid. 47).

Also aspects of individual school success are thought to have an effect on a student's educational choices, especially in the technology and transport sector. Information from student selection systems show that the students who seek a study place in transport and technology sector of vocational upper secondary education and training have poor success in education (Poropudas & Kyrö 1999). In the metal and electrical ptograms the most important reason for educational choices was the student's own interest in the field. The second reason was that there was no possibility of getting into another field. (Luopajärvi 1995.) The school success of students can be affected by microlevel, institutional level and macrolevel performances. Thus, it should not be seen as an individual factor only.

Young people in comprehensive schools at the 9th grade consider industrial work to be unpleasant, lonely and monotonous production line work in dark factories. Only a few of the pupils consider an industrial occupation to be a desirable future. However, workers in industry like their work. They see the positive aspects of their work as the versatility, diversity and challenges. Also the possibility to work with other people is valued. Work in industry is still considered to be men's work and for a girl to choose the technology sector is considered to be radical and unusual. Altogether, the knowledge of young people about the content of work in the technology sector is weak. (Hyttinen 1998.)

Räisänen et al. (1999) have evaluated the machinery and metal technology field and electrical engineering field in vocational upper secondary education and training. Their report provides a comprehensive evaluation of the fields. The machinery and metal technology field has suffered from a lack of students. In 1990 one-third of the study places were occupied compared to the electrical engineering field where the occupancy rate was 100%. According to the management in vocational institutions, the standing of electrical engineering education and machinery and metal technology education was good (72%) or equal (22%) compared to other fields and sectors in the institution. The opinions of teachers and students in the institutes, however, varied from the managers' opinions. Only 26% of the teachers agreed that their educational sector was esteemed in their institutes. It is noticeable that the technology and transport sectors have a lack of status inside their own organizations as well and not only in the society outside the institutions.

Results of research into the Maine project (reputation project) show that the educational institutions, their personnel and also the companies operating in their living environment had a significant influence on young people (Yli-Erkkilä 2002). The metal sector has the following appearance to young people: the focus of the image of metal sector is on welding, the connections between companies in the sector, occupations in the sector and the students' own study place is unclear, and the companies in the sector are unknown.

The components of mental images of young persons were: companies, products, contacts with the companies and personnel, the occupations and people in the sector, the institutions and students in the sector, information and information sources, common opinion and attitude climate, knowledge about the skills needed in the sector. (Ibid. 7.) Yli-Erkkilä reports that the metal sector has not succeeded in communicating the changes it has made to those in the business sector. The industry is still considered to be a black smoke pipe industry.

Aula and Heinonen (2002, 37) discuss the terms image and reputation. They define the terms in the following way: Image is company image, which is based on the visual image of the company. It is composed of mental images and beliefs. Image is something that a company wants its interest groups to think about it. Reputation is the evaluation of the company made by the interest groups. The evaluation is based on mental images and experiences. The company has only one reputation but it is composed of various factors. Reputation is founded on the factual performance of the company. (Aula & Heinonen 2002, 61.)

Place marketing research discusses the relationship between image and attractiveness. "Improving an image is not sufficient to increase a place's fundamental

attractiveness. Places also need to invest in special attractions. Clearly neither image nor attraction can provide the complete answer to a place's development." (Kotler et al. 1999, 55.) In the ongoing debate, unfavourable mental images are frequently considered to be the main cause for the low attractiveness of vocational upper secondary education and training.

3.5 Model of Attractiveness of Vocational Upper Secondary Education

There is no existing model of attractiveness for vocational upper secondary education and training. This research aims at constructing a model, which would represent the relationship between and inter-play of the elements and factors in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology.

Models serve as a linkage between theory and reality (Olsson & Sörensen 2001, 35). Silverman (2000, 77) defines a model to be an overall framework for looking at reality and Dickmeyer (1989, 153) defines a model to be a simplification of a complex system. Dickmeyer continues that models are sets of relationships between variables that characterize complex systems. The variables are chosen because the researcher thinks that they can be manipulated.

According to Puolimatka (2003, 3)

> "a model can be defined as an assumption or abstraction of reality; the aim of a model is to simplify our conception about that entity by bringing up it's essential aspects. A model is a certain design entity, in which the connections of the components appear. With the help of a model we can attempt to outline entities, define the mutual relationships of the components and draw conclusions about the elements of the entity that have not yet been empirically researched."

Dickmeyer (1989, 154) argues that one model may have more interesting variables than the other, but there is no perfect or best model. Two different models may both be perfectly true in their predictions, because their predictions are limited. *Models are ways of seeing the world, and examining the world with models makes the researchers into observers that strive to grasp the increasing number of dimensions and interactions in the complexity of our social system* (Ibid. 159).

Some researchers consider theories to be more scientific than models. They claim that a theory is a model tested by research. A model can turn into a theory once its validity has been verified through scientific research. However, one should be careful and avoid naming a model as a theory, until it has gained scientific support. (Hirsjärvi et al 1997; Metodix 2003.) Dickmeyer (1989, 156) claims that a theory lasts until it fails a critical test and that a model lasts until its predictions appear absurd. The critical difference is in how theories and models are tested and used. Models are used to explore systems so that at some point a theory can be

built. Dickmeyer (Ibid.) claims that social sciences are made more of models that of theories.

Tirri (1999, 43-44) describes the process of modeling in educational research as having four separate phases: 1. Problem: there is an existing need to model a part of reality and to make decisions based on the model. 2. Modeling: the best realizable model is constructed based on a priori knowledge and available data. 3. Prediction: the model is used to predict the object of interest. 4. Decision making: decisions are made for performance and activities based on predictions. The best model is chosen from several models.

The constructive research process, which is presented in detail in Chapter 4, contains the following seven phases: 1. Find a practically relevant problem that also has the potential to contribute to theory. 2. Examine the potential for long-term research cooperation with the target organization(s). 3. Obtain a deep understanding of the topic area, both in practice and in theory. 4. Innovate a possible solution and develop a problem solving construction, which also has potential for theoretical contribution. 5. Implement the solution and test how it works. 6. Consider the scope of applicability of the solution. 7. Relate the results to prior literature. (Lukka 2000, 116-121.) The phases in the process of modeling educational research and constructive research process are rather similar. Only the phase of examining the potential for long-term research cooperation with the target organization(s) is missing from the process described by Tirri (1999).

For practical use, the constructed models can be developed further to work implemented as assessment tools for practitioners by developing the factors into question series (Ståhle et al. 2004).

This research aims to develop a model of attractiveness of vocational upper secondary education and training in machinery and metal technology, which could lead to further research that both uses and refines the model. In this research the main focus is on the elements, contributors to and detractors from attractiveness of vocational upper secondary education and training in machinery and metal technology. The researcher believes that the contributors to and detractors from attractiveness can be manipulated and influenced through various procedures.

3.6 Summary of Key Concepts of the Research

Table 20 presents the focal concepts of the research. The key concepts are career choice and development, attractiveness of an educational field and interest. Other focal concepts are context, elements of attractiveness, contributors to and detractors from attractiveness and model of attractiveness.

The theoretical framework is based on career choice and development, in which the context levels of attractiveness (macrolevel, institutional level and microlevel) operate as observation levels. Each context level contains elements of attractiveness. The elements are the general categories which contain specific factors that contribute to or detract from the attractiveness of the machinery and metal technol-

ogy field. In the center there is the individual and his or her interests which cause him or her to persevere in acting and career decision making.

Table 20. *Key Concepts of the Research*

Concept	Definition
Career Choice	Career choice denotes the process of selecting a career (Brown 2003, 7).
Career Development	Career development is defined as a complex lifelong process involving psychological, sociological, economic, and cultural factors that influence individuals' selection of, adjustment to, and advancement in the occupations that collectively make up their careers (Brown 2003, 20).
Attractiveness of an educational field	The attractiveness of an educational field is the standing of the field in the range of choices of the education seekers. The range of choices consists of the possibilities that the education seekers know and what they prefer as their potential study places. (adapting Raunio 2002a, 15.) *The definition is anticipated in the process of the research.*
Interest	Interests expedite person-environment interactions into dynamic processes that guide an individual towards perseverance in her acting, thinking and feeling (adapting Valsiner 1992 and Savickas 1999).
Context	Context is constructed by many dynamic social, cultural, economic, and personal variables that are involved with one another (Chen 2003, 6). Context can be defined as a complex whole, which is constituted of many interrelated and interwoven parts (Young et al. 2002, 207).
Elements of attractiveness	The observation levels of attractiveness contain elements, each of which include specific factors that contribute to or detract from attractiveness.
The contributors to and detractors from the attractiveness	The contributors to attractiveness are the factors that support career choice development of the students. The detractors from attractiveness are those factors that do not support the career choice and development of the students.
Model of attractiveness	A model of attractiveness represents the relationship between and inter-play of the elements and factors in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology.

4 RESEARCH METHODOLOGY

4.1 Background Assumptions of the Researcher

In this chapter the researcher describes background assumptions, methodological choices and issues related to the quality examination of the research. Data collection and analysis are described in detail in Chapter 5, Implementation of the Research. The researcher agrees with Blumer (1969, 23) in that "methodology covers the principles that underlie and guide the full process of studying the obdurate character of the given empirical world."

This research employs a phenomenological approach that is interested in seeing how people interpret their worlds, and how the researcher can interpret their interpretations. More accurately, the phenomenological research begins with the individual person and the person's awareness of the world and the researcher attempts to get inside the meanings and the world of the person. (Shank 2002.)

The research process is a hermeneutic spiral, shown in Figure 19 in Chapter 5, in which the researcher goes through the research subject several times trying to release herself from her own obstacles and to understand her research data. By treating the research as a spiral process, the researcher aims to delve more deeply into her research subject and also to deepen her own self-understanding (Metodix 2003).

The ontology of the research can be said to be idealistic in the sense that the reality of individuals and societies is based on meanings. The research involves interpretation of these meanings, not merely an objective scientific description based on hypothesis to be tested. (Puolimatka 2003, 10.) The objective of the research is to understand the reality of the students by the meanings they give to their behaviour when they choose their area of study and the institution at which it will be pursued.

The epistemological basis of this study is rationalism, in which knowledge about reality is obtained by awareness, comprehension or intuition (Puolimatka 2003, 1). Knowledge of phenomena is collected and analysed with various methods, the choice of the sequential methods being associated with the earlier phases of the research process. The knowledge interest of this study is practical, interpretative knowledge, which seeks to understand individuals in their environment (Metodix 2003). Raunio (1999) emphasizes that from the attitude towards social reality within a practical knowledge interest is not domination or manipulation but understanding.

Lukka (2001) asserts that constructive research may contain a combination of technical, practical and emancipatory knowledge interests, the most common being

technical and practical knowledge. A technical knowledge interest means that with the new constructions we improve our ability to anticipate and control real-life processes. Lukka (Ibid.) asserts that a practical knowledge interest appears mainly in the beginning of the research as the researcher lays a foundation in order to be able to construct the model.

In this research, a practical knowledge interest is present in all phases, including the beginning, the actual implementation and the construction phase. The practical interest of the research is to instruct decision-making. Raunio (1999, 368) asserts that research should generally help to understand problems in decision-making. Stake (1994, 244) claims that case studies offer practitioners and policy makers an extension of experience and can be utilized as a disciplined force in public policy setting.

In this research, the research process and constructed model of attractiveness of initial vocational education provide a new knowledge base to various stakeholders and decision makers in the vocational education sector. The research also aims to stimulate discussion of the phenomenon. Although debate has already occurred at both the national and local level, this research will bring new elements and aspects of attractiveness into discussion (Raunio 1999).

When investigating human action it is essential to reflect the human nature of the researcher. The human nature of the research deals with the question of whether social reality is external to the human beings acting in the reality or whether the social reality is created by human beings, that is, what is the relationship between human beings and their environment (Burrell & Morgan 1994; Raunio 1999). In this research, individuals are seen as autonomous subjects, whose actions are based on knowledge and intention. The belief is based on voluntarism, which holds that human beings are active and reflective individuals (Burrell & Morgan 1994). Puolimatka (2003, 10) points out that in voluntarism "a human being has so much indeterminism that she is responsible for her own actions. A human being is the initiator of her own actions and expresses creativity and free intentions."

The researcher conceives that symbolic interactionism (Blumer 1969) has the same key premises as the background assumptions of the researcher. These three premises are: first, human beings act toward things on the basis of the meanings that the things have for them. Second, the meaning of such things arises out of the process of social interaction between people. Third, these meanings are handled in, and modified through an interpretative process used by the person in dealing with things he or she faces. (Ibid. 2.)

4.2 Constructive Case Study

4.2.1 Case Study Strategy

In this research, a case study approach is taken to data collection. Case studies are generally of the 'explanatory type', 'exploratory type' or 'descriptive type' (Yin 1994). This study is an exploratory type study in which the researcher searches for understanding of the problem of attractiveness of initial vocational education. Stake (1994, 236) asserts that "case study is not a methodological choice but a choice of what is being studied." He explains that the researcher can use various methods, but in a case study the researcher concentrates on the case. The case need not be a person or enterprise, it can be an institution or population, or any 'bounded system.' What is happening within the boundaries determines what the study is about and what is kept in the focus of the study (Stake 2000, 23). The bounded system of this case research is inside the three context levels of the research: microlevel, institutional level and macrolevel.

Järvinen and Järvinen (2000, 78) point out that in a case study the researcher investigates a single case of multiple cases. Data collection can involve questionnaires, interviews, observation and/or use of archive materials, and the data can be qualitative or quantitative. The nature of a case study is descriptive and theory testing, which means that models or theories can be developed on the ground of a certain case. The description of a case is significant because sometimes it can happen that nothing new is found theoretically but the description of the case provides new knowledge about reality.

Yin (1994, 1) characterizes case study as a preferred strategy when 'how' and 'why' questions are being posed and the investigator has little control over events. When the focus of the research is on a contemporary phenomenon in a real-life context, the use of a case study strategy is advised (Ibid.) In this research, the case study strategy is chosen for a contemporary phenomenon, which is the decreasing attractiveness of upper secondary vocational education and training in the area of machinery and metal technology in the Lahti Region.

In a case study it is essential that the research data comprise an entity. There is no special analysis method for case studies and consequently methods of analysis are determined by the data (Saarela-Kinnunen & Eskola 2001). In this research both qualitative and quantitative methods of data collection and data analysis are used. The research process and the various data collection and data analysis methods of this case study are carefully described in order to make the research transparent to the reader.

This research contains various subsections or elements, which characterize the attractiveness of initial vocational education. Further, various stakeholder groups have an influence on the attractiveness. These groups are the labor market, educational institutions, the students and their families. The researcher has made choices

about the subsections and groups of the case. She has selected the interviewees, the students groups and the schools to be studied. Some choices have been made with the head masters of the vocational institutions, but the final decision of the subsections to be studied was made by the researcher. The selection of student groups has been made in a manner that assures variety and comparability between student groups. The primary criterion for selection was the possibility of learning from the various viewpoints of diverse stakeholder groups. (Stake 1994; Stake 2000.)

Stake (1994, 239) points out that in case studies the researcher has to make a decision about how long and how much the complexities of a case should be studied. How much of the case can be understood and how much need a case be understood? Not everything about a case can be studied, as in this research, but the researcher can suggest areas for further research.

By implementing this research as a hermeneutic spiral process the researcher gets closer and deeper into her research subject. Various data collection and analysis methods enable the phenomenon to be examined from different viewpoints. The researcher can stay with her study in a spiral process for a long time, but the length of the process may discourage the subjects of the research from cooperation. Thus, the solution of a real-world problem can become problematic in ways that are not contemplated in the methodological theory.

4.2.2 Constructive Research

Case study is a methodological umbrella that encompasses a variety of approaches. This case study uses constructive research methodology that produces constructions (Kasanen et al. 1993). Lukka (1999) describes constructive research as a form of case study, but it also resembles action research. In both approaches the researcher uses an empirical approach to achieve the research objectives. Constructive case studies develop and implement a new construct to solve problems through the use of models, diagrams, plans, organizations etc. (Järvinen 2001; Kasanen et al. 1993). However, constructive research differs from analytic model building, which aims to produce elegant solutions that work in principle but whose practical efficacy is often dubious (Ibid.). The purpose of a construction process is to achieve a movement from the initial state to the target state (Järvinen 2001, 91).

Constructive research methodology has been used primarily in management accounting research, but Vaso (1998) and Nieminen (2000) have also used it in education. In both studies the objective is constructive problem solving, but the data collection and analysis methods differ. Vaso describes his study to be "a constructive normative study which is aimed at problem solving. In the study there is combined an innovative, goal-oriented implementation of the problem and an empirical test of the solution as well as the examination of the extension of the area of application" (Ibid. 152). Nieminen describes the aim of his study to be "constructive problem solving and an effort to derive from the existing theoretical material from different domains and research results of the Growth Needs Project novel suggestions that can help the target group in question, this is sales managers, better deal with management of change" (Ibid. 24).

Figure 17 describes the key elements of constructive research as conducted by Lukka and Tuomela (1998). The researcher has employed the figure with core features of constructive research, which are presented and stressed in later literature on constructive research by Lukka (2000).

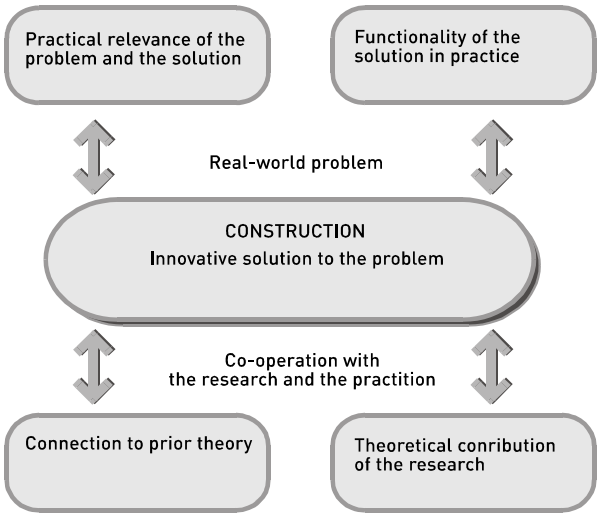

Figure 17. *Key Elements of Constructive Research (adapted from Lukka & Tuomela 1998, 25)*

According to Lukka the core features of the constructive approach are that it:

- focuses on real-world problems felt necessary to be solved in practice,
- produces an innovative construction to solve the initial managerial problem,
- includes an attempt to implement the developed construction and thereby test its practical applicability,
- implies a very close involvement and cooperation between the researcher and practitioners in a team-like manner, in which experiential learning is expected to take places,
- is explicitly linked to prior theoretical knowledge, and
- pays particular attention to reflecting the empirical results back to theory; the nature of the theoretical linkage varies, and—due to the partly heuristic nature of the constructive research process—cannot be predicted beforehand. *(Lukka 2000, 114)*

Table 21 describes the seven phases of a constructive research process as enacted by Lukka (2000). The phases are assumed to vary from case to case and the table also describes the phases of this research considered from the viewpoint of a constructive research methodology.

Table 21. *Phases of A Constructive Research Process*

Phases of a Constructive Research Process (Lukka 2000, 116-121)	Phases of This Research Considered From the Viewpoint of Constructive Research Methodology
Find a practically relevant problem that also has potential to contribute to theory.	This research is motivated by the growing shortage of students in the machinery and metal technology field in the Lahti Region. Both the management and teaching staff of the Lahti Region Educational Consortium and Salpaus Further Education, as well as employers in metal industry companies, are interested in understanding and solving this problem.
Examine the potential for long-term research cooperation with the target organization(s).	There is a history of cooperation between the target organizations and good potential for long-term cooperation in this research.
Obtain a deep understanding of the topic area, both in practice and in theory.	Chapter 1 in this dissertation provides detailed description of the phenomenon in real-world terms and Chapter 3 provides the theoretical framework.
Innovate a solution idea and develop a problem solving construction, which also has potential for theoretical contribution.	The research process proceeds phase by phase collecting research data to solve the problem of the unattractiveness of vocational upper secondary education and training in machinery and metal technology. The problem solving construction, i.e. the model of attractiveness, is based on theoretical knowledge.
Implement the solution and test how it works.	The implementation of the solution will require a continuation over the long term. The stakeholders in educational institutions and companies as well as policy makers look forward to implement the solutions of the research.
Consider the scope of applicability of the solution.	The scope of applicability of the solutions is discussed in Chapter 8. Also, the potential further diffusion of the construction is considered.
Relate the results to prior literature.	The theoretical contribution of the research and its results is discussed in Chapter 8.

During the research process it is essential that all interest groups are committed to the project and that the researcher obtains all significant material for her use. Lack of commitment is one of the risks of a constructive research. It is essential that the researcher is innovative in constructing the new model, but at the same time she has to be critical and neutral in relation to the results of the research. Critical reflection on the results is important in constructive research as in all science (Lukka 2000).

Kasanen and al. (1991, 320) describe the key features of construction to be the following: proceeding step by step and verifying that each construction phase is valid. Generally, if the construction can be successfully applied to the phenomenon under consideration then this may be taken as a demonstration of its practical relevance. Järvinen (2001) emphasizes the reporting of a constructive research: the

researcher must describe the construction process in detail, argue her selections and explain her decisions.

Vaso's (1998) study comprised a functionality test of the constructed quality assessment model and thus conforms to the process of constructive research. Nieminen (2000) demonstrates his construction model of education as a saviour, but the testing of the construct was not accomplished. Järvinen (2001, 88) considers the constructive research method to be applied research. He asserts that instead of the final product it is possible to accept a prototype or even a plan. In this research, the final phase is to construct a model that explains the causes of attraction to vocational education. The final model might be considered to be a prototype, but, as Järvinen (Ibid.) explains, the utility of the innovation can also be evaluated afterwards. Ideally, the innovated model will be verified through long-term achievements. If the construction or model cannot be implemented during the research process, the plan of implementation should be described in detail (Ibid. 103).

Along with the evaluation criteria of any field research, Lukka (2000) points out that in constructive research two additional criteria should be considered. First, the new construction should meet the criteria of relevance and it should be feasible. Second, the importance of cooperation between the researcher and the practitioners cannot be over emphasized. Lack of commitment by the target organisation is one of the most common problems for constructive researchers (Ibid.). Järvinen (2001) also emphasizes communication in the representation of a new model. New models are used to communicate ideas to stakeholders. Use and maintenance of a new model can be evaluated by using the experiences of users as reported anecdotally in their stories (Ibid.).

4.3 Multiple Triangulation

According to Raunio (1999, 345) the strengths and weaknesses of qualitative and quantitative research methods depend on whether the researcher wants to analyse the phenomenon on the macrolevel of society or on the microlevel of social interaction. The strengths and weaknesses also depend on whether social reality is examined from the structures or processes point of view and whether the researcher is interested in the trends of differences and dependencies in the population at large or interest is directed to typical characteristics of a special group. If the purpose is to get a general view of social reality, both qualitative and quantitative research methods are needed.

In this research, the bounded system of the case contains macrolevel, institutional level and microlevel aspects. Thus, examination of the phenomenon requires both qualitative and quantitative research methods.

Creswell (1994, 177) explains that researchers often present a study within a single, dominant paradigm—qualitative or quantitative—but take one small component of the overall study from an alternative paradigm. In this research, however,

the dominant method cannot be defined because both qualitative and quantitative methods are used extensively.

Denzin identifies four types of triangulation:

1. data triangulation: the use of variety of data sources in a study,

2. investigator triangulation: the use of multiple observers are used as opposed to single observer,

3. theory triangulation: the use of multiple perspectives to interpret a single set of data,

4. methodological triangulation: the use of multiple methods to study a single problem. *(Denzin 1978, 295-307)*

In methodological triangulation, Denzin distinguishes two forms. These are: within-method triangulation and between-method triangulation, which is also known as across-method triangulation. In within-method triangulation the researcher takes one method and employs multiple strategies within that method to examine data. In between-method triangulation the researcher combines various methods to measure the same empirical unit. (Ibid. 302-303.)

This research is implemented by using both methodological triangulation (between-method triangulation) and data triangulation. The strategy can be said to be multiple triangulation in which the researcher combines multiple sources of data and various methodologies in one research (Denzin 1978).

Triangulation has its critics and its advocates. Silverman (2000, 177) criticizes triangulation and claims that "triangulation is an attempt to get a 'true' fix on a situation by combining different ways of looking at it or different results." As he sees it, the problem with using multiple methods is that the researcher may consider that she reveals the 'whole picture' of the studied phenomena and the data may be under-analysed (Silverman 2000, 99).

On the other hand, Denzin and Lincoln (1994, 2) point out that "triangulation is an attempt to secure an in-depth understanding of the phenomenon in question." Several researchers support the use of triangulation (Anfara & Brown 2001; Denzin 1978; Eskola & Suoranta 1998; Hirsjärvi & Hurme 2000; Miles & Huberman 1994; Punch 1998; Raunio 1999; Zinn 2002). Different research methods complete the understanding of the research subject. Triangulation also increases the reliability of a research when results by different methods give comparable results that can be checked against each other. Other supporters of triangulation assert that it is meant to be a heuristic tool for the researcher to get a more holistic view of the research setting (Janesick 1994; Morse 1994).

Kelle (2001, 8) considers triangulation to be either a process of cumulative validation or a means to produce a more complete picture of the phenomena under investigation. He maintains that it is often necessary to describe sociological micro- and mesolevel phenomena with the help of qualitative data and macrolevel phenomena with the help of quantitative data (Ibid. 26).

Miles and Huberman (1994) believe that a combination of qualitative and quantitative research design is advantageous. They describe four designs that link qualitative and quantitative research data. “Design 3 alternates the two kinds of data collection, beginning with exploratory fieldwork, leading to the development of quantitative instrumentation, such as a questionnaire. The questionnaire results can be further deepened and tested systematically with the next round of qualitative work” (Miles & Huberman 1994, 41). The research design in this study follows the ‘Design 3’ model.

The progress of this research is based on methodological triangulation and follows the model of ’between-method triangulation.’ This means that the phenomenon is investigated by using methods that arise from qualitative and quantitative approaches in different phases of the research. The appropriate method is selected at each stage in order to give a comprehensive and reliable representation of the phenomena. The researcher sees research methods are instruments to identify and analyze the research data derived from the empirical world, and thus the suitability of the methods is determined by the degree to which they enable this process (Blumer 1969, 27).

Data triangulation is achieved by acquiring various types of data: texts, interviews and quantitative data. The data sources are the stakeholders at the micro-, institutional- and macrolevels who determine the attractiveness of upper secondary vocational education and training in the area of machinery and metal technology: students, personnel in educational institutions and representatives of the business sector.

Table 22. *Research Questions and Data Collection Methods*

Research Questions	Data Collection Method
What are the elements of attractiveness to students of vocational upper secondary education and training in machinery and metal technology?	Preliminary discussions Short student essays Focused interviews
What factors are most important in contributing to or detracting from the attractiveness to students of vocational upper secondary education and training in machinery and metal technology?	Questionnaires to students
What model would represent the relationship between and inter-play of these elements and factors in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology?	Construction from the research data and theoretical knowledge

This research is a case study and the objective is not to determine the whole objective ‘truth’ of the phenomena of attractiveness of vocational education. The objective is to collect reliable data to construct a model of attractiveness in the case study research context. In this research, triangulation has two purposes: to ensure the reliability of the research and to obtain deeper understanding.

Table 22 is a summary of research questions and data collection methods. The use of each method is described in detail in Chapter 5, Implementation of the Research.

4.4 Quality of the Research

In this research, various data collection and data analysis methods are used in multiple triangulation. The quality of the research can be examined neither from the qualitative research paradigm nor from the quantitative research paradigm. The concepts of 'reliability' and 'validity' have been criticized, mainly because their origin is in quantitative research paradigm and they describe the quality of quantitative studies. Reliability means that mistakes and deviations in the research are minimized so that results are precise. Validity means that the conclusions of the research faithfully reflect the reality in which the research has been implemented so that results are accurate. (Syrjälä & Numminen 1988.)

The criteria of validity and reliability in quantitative research can be described in qualitative research as internal validity, the logic of the research. Measurement reliability means the consistency of the measurement. Measurement validity means the extent that the instrument measures what it claims to measure (Punch 1998, 98-101).

Eskola and Suoranta (1998, 212) suggest that approaches to the use of the terminology of reliability and validity in qualitative research can be divided into three types: those that apply traditional terminology to qualitative research as far as possible, those that develop new implications of traditional terminology, and those that reject the traditional terminology and employ new terms. As the researchers assert, it is the meanings that are important, not the words.

Miles and Huberman (1994, 277) have compiled five issues of 'goodness criteria,' that are somewhat overlapping: objectivity/confirmability; reliability/dependability/auditability; internal validity/credibility/authenticity; external validity/transferability/fittingness; and utilization/application/action orientation. These sets of terms are used when assessing the 'trustworthiness' or 'authenticity' of the research. In case study protocol, the following tests of quality can be used: construct validity, internal validity, external validity and reliability (Yin 1994, 33).

Lincoln and Guba (2000) talk of transferability rather than generalization of a case study. They ask (Ibid. 40): "How can one tell whether a working hypothesis developed in Context A might be applicable in Context B?" Lincoln and Guba suggest the following answer to this question: The degree of transferability is a direct function of the similarity of the two contexts and can be called 'fittingness,' which can be defined as the degree of congruence between the sending and receiving contexts. If the contexts are 'sufficiently' congruent, the working hypothesis from other context may applicable in other contexts. When making decisions about transferability the researcher needs to have information from both contexts. (Lincoln & Guba 2000, 40.)

Raunio (1999, 333) also discusses the transferability of research results. Especially in qualitative research, the objective is not to produce repeatable and generalizable results. The objective is to produce transferable results for the users of research, who may be researchers or practitioners. This research aims to produce results for decision making and planning in initial vocational education.

Punch (1998, 250) discusses mixed methods, their use and evaluative criteria. He employs the term 'disciplined inquiry,' which indicates that good research is a disciplined form of inquiry, the parts of a research project fit well together. The goodness or quality of a research is established from the quality of each part of the research process. Evaluative criteria are presented for each of the five main parts of a research project: the 'set-up' of the research, the empirical procedures used in the research (design, data collection, sample and data analysis), the quality of data, the results and conclusions reached in the research and the presentation of the research. (Ibid. 253.)

In this research the examination of the overall quality follows the quality issues of Miles and Huberman (1994, 277-280) and the evaluation criteria of the research process described by Punch (1998, 253 - 263). Quality issues and relevant queries are introduced in Table 23. The quality assessment of the research incorporates the essential parts of scientific research as described by Blumer (1969, 24-26). These parts are: the possession and use of a prior picture or scheme of the empirical world under study, asking the question, determination of the data to be sought, determination of relations between the data, interpretation of the findings and the use of concepts.

Kasanen and al (1993) argue that successful constructive research, which has the following features, will conform to the most significant characteristics of science. The features are: an innovative solution to a real life problem, the potential of the solution for more general adequate is examined and the usability and theoretical connections are demonstrated.

The research method depends on the basic scientific assumptions of the researcher, the nature of the phenomenon under research, research problem, and various background factors. The research method is not only a means for carrying out the research process. The researcher's personal influence is always crucial, no matter what methods are chosen for data collection and analysing. She decides how and from whom the data is gathered and what variables are taken into account. She also decides what is emphasized, and what factors do not require attention (Metodix 2003). Malterud (2001) points out that in every phase of a qualitative research the effect of the researcher should be assessed and shared, the bias cannot be eliminated but it can be reported and considered.

Table 23. *Quality Issues and Relevant Queries (Miles & Huberman 1994)*

Quality Issue	Relevant Queries
objectivity confirmability	What is the researcher's bias to the research? What is the neutrality of the research? Are the study's general methods and procedures described explicitly and in detail? Can we follow the actual sequence of how data were collected, processed, condensed/ transformed, and displayed for specific conclusion drawing?
reliability/dependability/ auditability	Is the research process consistent and stable? Have things been done with reasonable care? Are the research questions clear and are the features of study design congruent with them?
internal validity/ credibility/ authenticity	Do the results of the study make sense? Are the results credible to the people we study and to the readers? Are the results internally coherent and are the concepts systematically related?
external validity/ transferability/ fittingness	Are the conclusions transferable to other contexts? Are the characteristics of the original sample of persons, settings, processes (etc.) described fully enough to permit adequate comparisons with other samples?
utilization/application/ action orientation	What does the study do for its participants? What is the pragmatic value of the research? Do the actions taken actually help solve the local problem?

The data collection and analysis methods chosen, are discussed in detail in Chapter 5, Implementation of the Research. The assessment of the quality of the research is discusses in Chapter 7 Evaluation of the Quality of the Research.

5 IMPLEMENTATION OF THE RESEARCH

5.1 Research Process and Research Schedule

The research process is illustrated in Figure 18. It involves four overlapping phases, each of which supply information and knowledge to the next phase. The final phase of the research is to construct a model that represents the relationship between and inter-play of the elements and factors in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology.

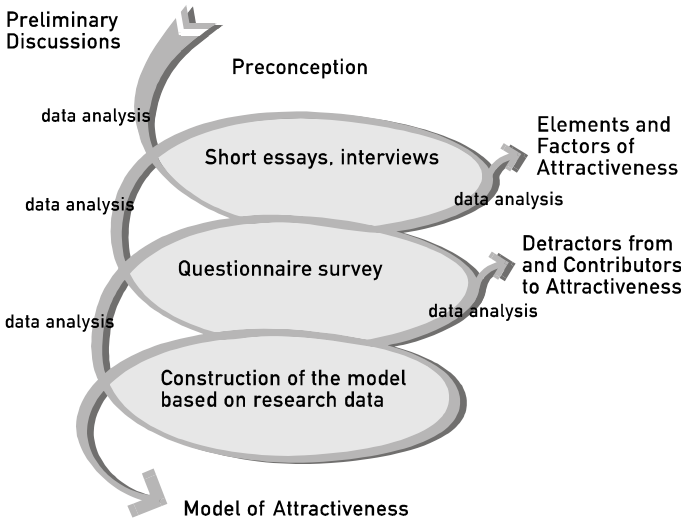

Figure 18. *Research Process*

The research is a case study in which the researcher uses both qualitative and quantitative approaches and both methodological and data triangulation. The research methods were refined during the research process on the basis of research data; that is, the methods were chosen according to the information that emerged from the previous phase of the data analysis and what had to be determined in order to proceed with the next phase of the research.

The research process aims at exploration and inspection in ways that Blumer (1969) describes them. He asserts that exploration is the means of developing and refining the research process so that the research problem, the direction of the research, data, analytical relations, and interpretations arise out of, and remain

grounded in, the real world under study (Ibid. 40). Inspection consists of examining the element being researched by approaching it in a variety of different ways, viewing it from different angles and asking many different questions (Ibid. 44).

Table 24. *Schedule of the Research*

Research Phase	Point in Time
Developing the research plan and the theoretical framework; preliminary discussions, preconception phase	autumn 2002 spring 2003
1st Phase of data collection and data analysis Data collection through short essays and focused interviews. Results of data analysis: elements of attractiveness.	spring 2003
2nd Phase of data collection and data analysis Data collection with questionnaires. Results of data analysis: contributors to and detractors from attractiveness.	autumn 2003 spring 2004
3rd Phase of the research Constructing the model of attractiveness	autumn 2004
Compiling the research	autumn 2004

The schedule of the research is presented in Table 24. The qualitative research data was collected through short essays, focused interviews and open- ended questions in the questionnaires. The quantitative data was collected using structured questions in the same questionnaires. The analysis and interpretation of research data was accomplished using methods appropriate to each type of data. The collection of data and the data analysis overlapped each other in various phases of the research. The data collection and data analysis procedures are described in Section 5.2 following.

The main research question is: What model would represent the relationship between and inter-play of the elements and factors of attractiveness in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology?

In the final phase, a model of attractiveness of vocational upper secondary education and training of machinery and metal technology is developed. This construction phase of a constructive case study involves the creation of a proposed solution and development of a problem solving construction, which also has potential for theoretical contribution to the topic of study (Lukka 2000).

5.2 Procedures of Research Data Collection and Analysis

5.2.1 Preconception Phase and the First Phase of Data Collection and Analysis

Preconception Phase

The research question for the first phase of the research is: What are the elements and factors of attractiveness to students of vocational upper secondary education and training in machinery and metal technology? The first phase of the research was linked to the preconception phase.

Preliminary discussions with various interest groups and ongoing discussion in the media about the attractiveness of vocational education were the basis for the preconception of the phenomena. Preliminary discussions were conducted with representatives of industrial enterprises and vocational institutions during autumn 2002 and spring 2003. A schedule of these discussions is presented in Appendix 1.

The interviews and media texts were not systematically analyzed. Rather, the information from them enriched the viewpoints of the elements and problems of lack of attractiveness in vocational upper secondary education and training in machinery and metal technology. On the basis of these interviews and media texts, the researcher compiled a preconception of the elements and factors of attractiveness.

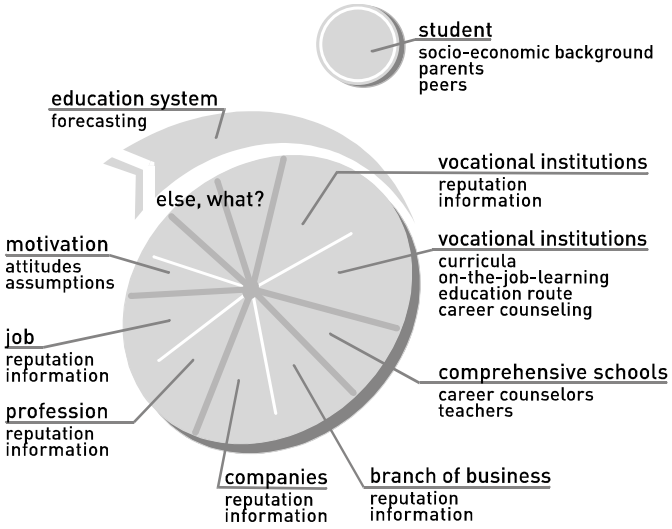

Figure 19. *Preconception of the Elements of Attractiveness of Vocational Upper Secondary Education and Training*

Figure 19 illustrates the preconception of the main elements and factors of attractiveness of vocational upper secondary education and training in machinery and metal technology. The main elements presented in the figure are: education system,

vocational institutions, comprehensive schools, occupations, content of work, enterprises in the business sector, branches of business and the student's socio-economical background and peers.

Janesick (1994, 213) points out that preliminary interviews can assist the researcher in focusing on particular areas that may have been unknown previously. The preliminary interviews can also be used to test certain questions and to shape the study accordingly. The preliminary interviews in this research dealt with the problem of the decreasing attractiveness to students of the metal sector (despite an increasing number of available jobs) and the various actions taken to promote the attractiveness of vocational upper secondary education and training in machinery and metal technology.

Collecting Research Data with Short Essays from the Students

The first phase of data collection involved a qualitative method, in which students in vocational institutions wrote short essays concerning their educational choice. It was essential to get information about the students' educational choices described by the students in their own words. Puolimatka (2003, 9) asserts that the behavior of a human being can be understood and explained reasonably only if we are familiar with the opinions of those persons whose behavior is being investigated. The short essays were written at Lahti Vocational Institute, Orimattila Institute and Heinola Institute. Altogether 80 short essays by first year students in machinery and metal technology field were gathered.

The essay questions were: Why did you apply to machinery and metal technology field? Why did you choose Lahti Vocational Institute/ Orimattila Institute/ Heinola Institute? Table 25 provides a breakdown of the age, gender and primary study choice of the students who participated.

Table 25. *Statistical and Background Data of the Essays of Students*

Vocational Institute	Number of Students	Machinery and Metal Technology as Primary Choice	Male/Female	Age Between 16-18 Years %
Lahti Vocational Institute	55	45	55/1	77
Heinola Institute	16	15	16/-	100
Orimattila Institute	9	8	9/-	100
Together	80	68	79/1	91

Teachers in the vocational institutes administered the essays. They were advised not to influence the contents of the essays by commenting or stating their own opinions beforehand. However, the teachers were encouraged to discuss the subject with their students after they had written the essays.

The length of the essays was generally only a few sentences. An example of a typical short essay is: I applied to the machinery and metal technology field *"because this business sector was the most interesting and this sector needs labor force. Also this place is near my place of residence."*

Analysis of the Short Essays of Students

The student essays were analyzed by using content analysis. They were transcribed into an MS Excel file. The researcher read the short essays through several times. The themes of the students' orientation to their educational choice and towards the particular institute were derived from the texts. In this phase the researcher used the sorting and filtering utilities in MS Excel. The themes from the short essays are summarized in Tables 30 and 31 in Chapter 6.

Research Data Collection with Focused Interviews

The second method of data collection employed in the first phase of the research was focused interviews. The interview protocol was based on the research questions and the analysis of the short essays. The focused interviews were analyzed to identify the elements and factors of attractiveness.

Ruohotie (1986) states that one characteristic feature of an interview is that the researcher is able to collect data using two research methods at the same time: she guides the person to describe the contents of her conception—experiences and beliefs—while she also acts as an observer in the interview situation. In this way she has the ability to go inside the phenomenon to be examined and to see reality as the interviewees see it. Ruohotie comments further that both interviews and questionnaires are methods that are reactive methods affecting on the contents of the consciousness of the participants. Alasuutari (1999) also emphasizes that interviews should be considered as interactive situations, in which it is important to notice and utilize the relationship between the interviewer and interviewee. The interview is not only a source of information or data, but it can also lead the interviewer deeper into the social reality of the interviewees.

In focused interviews the themes of the interview are defined in advance, but the questions are not strictly structured and the sequence of the questions can vary during the interviews (Eskola & Suoranta 1998, 87). The themes pursued in these interviews are introduced in English in Appendix 2. The interview questions were primarily designed to elicit the interviewees' descriptions of the elements and factors of attractiveness of vocational education in machinery and metal technology field. The contributors to and detractors from attractiveness were discussed explicitly. The perspectives of local and regional stakeholders are important, because the purpose of the research is not only to find out the elements of attractiveness, but also the factors and conditions that make machinery and metal technology an attractive educational choice.

Focused interviews with representatives of stakeholder groups in educational institutions and companies were conducted during May and July 2003. There were eleven interview sessions and thirteen interviewees. The interviewees represented the following local stakeholders: human resources manager, metalworker, career counselor, educational manager, head master, student and teacher. The interviewees were selected randomly from comprehensive schools. The interviewees from vocational institutions were selected to represent various institutes in Salpaus Further Education. Representatives of companies were selected to have both long-term and short-term experience in metal industry. The interview sessions are recorded in Appendix 1.

The interviews with the students in vocational institutions were both group interviews involving two students at one time. Group interviews were used to allow the interviewees to support each other and to encourage each other to respond (Eskola & Suoranta 1998, 95-98).

The interviews took place at the workplaces or study places of the interviewees. A total of 7 h 15 min of interviews were recorded using an MD-recorder and transcribed verbatim for later analysis. This resulted in 196 pages of single spaced 12 point text.

Analysis of Focused Interviews

Schwandt (1997) describes the analysis of qualitative data to require procedures that facilitate working back and forth between data and ideas. The analysis, or interpretation, includes organizing, describing and reducing the research data. Eskola and Suoranta (1998, 179) recommend categorizing when the researcher wishes to extract essential data concerning a practical research problem. Coffey and Atkinson (1996, 108) point out, however, that analysis of research data involves representing and reconstructing the social phenomena, not merely classifying, categorizing, coding and collating data.

The researcher conducted the interviews by herself and the transcribing was done by a research assistant. The researcher then read through the transcribed interviews several times during the summer and autumn of 2003 and began to analyze the texts in October. The analysis process occurred in six phases. Each phase identified and framed the elements and factors of attractiveness. Categorization of the data was accomplished in several phases. The analysis process for the focused interviews is described in Figure 20.

The *first phase* of the analysis was a content analysis to identify the themes in the discussions. What were the themes that the interviewees discussed? Did the interviewees discuss the contributors to and detractors from attractiveness? The themes, and the elements of attractiveness, were first compiled from single interviews. This information was recorded in separate columns of an MS Word document. The data columns were named: elements of attractiveness in vocational upper secondary education, elements of attractiveness in vocational upper secondary education of machinery and metal technology, contributors to and detractors from attractiveness.

The *second phase* of the data analysis examined the themes in the interviews of each individual stakeholder group. The groups were: the students in vocational institutions, the personnel in comprehensive schools, the personnel in vocational institutions and the personnel in metal sector companies.

The *third phase* of the data analysis developed categories from each stakeholder group's interview analysis.

The *fourth phase* of the analysis compared the categories of each group's interview analysis and named the categories, which became the broad elements of attractiveness in vocational upper secondary education and training of machinery and metal technology.

The *fifth phase* of the analysis combined the categories/elements and factors of attractiveness of each group analysis.

In the *sixth phase* the results of the analysis were coded for the questionnaire design.

In the documentation of the interview data analysis the researcher used MS Word and MS Excel programs. The researcher exported the quotation texts from MS Word into MS Excel-file for coding and used the sorting and filtering facilities of the program for further analysis. In every phase of the analysis the researcher accomplished reduction and organization of the fragments. There was verification of the analysis results during each phase.

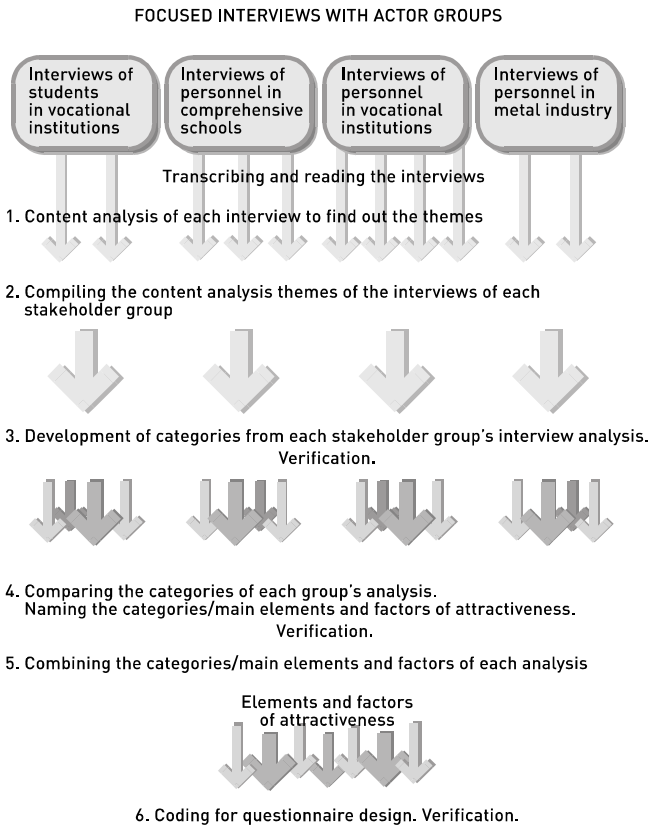

Figure 20. *Process for Analysis of Focused Interviews*

To analyze means to break down a whole into its components. Through reassembly of the parts the researcher understands the integrity of the whole and identifies its patterns. (Schwandt 1997.) In this analyzing process the researcher has broken down the interviews and through several phases of categorizing, reading, organizing and verifying she has identified the elements and factors of attractiveness of vocational upper secondary education and training in machinery and metal technology. The elements and factors of attractiveness are presented in Chapter 6.

5.2.2 Second Phase of Data Collection and Analysis

The research question for the second phase of the research was: What factors are most important in contributing to or detracting from the attractiveness to students of vocational upper secondary education and training in machinery and metal technology? The purpose of the second phase of data collection was to reveal the assumptions of groups of students from various educational institutes.

The quantitative aspect of the data collection was achieved using questionnaires directed to the students in vocational institutions, comprehensive schools and general upper secondary schools. In such quantitative research, data collection focuses on some specific aspects of the issues that are considered to be important (Raunio 1999).

The aim of the questionnaire survey was not to produce causal relationships. The structured items in the questionnaire yield quantitative data that provides an insight into the "big picture" of some specific aspects of attractiveness of programs and the selection criteria typically employed by students. In compiling the data there is an "averaging" process that reveals trends but obscures details. In order to understand the perspectives, values, intentions and thought processes of individual students and the wide spectrum of individual views, qualitative methods would be required. The open-ended questions on the questionnaire produced qualitative research data, which was analyzed with content analysis.

Questionnaire Design

The questionnaire measures the factors that are most important in contributing to or detracting from attractiveness of the educational program. The factors related to each element of attractiveness were identified in the analysis of the focused interviews and the short essays. In this way, the qualitative research facilitated the quantitative research at the same time that it provided background information about the context (Punch 1998).

The questionnaire form was designed by adapting Raunio's (2002b, 182-186) questionnaire structure, which measures the attractiveness of regions. Individual statements were determined from the previous research data of the present research. Gap analysis was used to determine the importance and satisfaction level of each factor. It also revealed the most successful and unsuccessful aspects of performance with respect to enhancing attractiveness. Questionnaires were used primarily to

assess the examinees' attitudes towards each of these aspects by asking them to evaluate their success/functionality and also their importance. The gap is determined by subtracting the satisfaction mean from the importance mean (Sillanpää & Ålander 2003). Gap analysis is widely used in quality management to identify the development needs of organizations. It has also been used as customer satisfaction analysis tool (Purdue University 2003). The questionnaire form is presented in English in Appendix 4.

Questionnaire categories and items are presented in Table 26. The categories—which are the elements of attractiveness—were determined from the analysis of interviews to be: individual, social system, comprehensive schools, vocational institutions, companies, education system and world-of-work. The elements and factors are discussed in detail in Chapter 6.

Table 26. *Questionnaire Categories and Items*

Categories/ Elements of Attractiveness	Number of Items	Items
Individual	14	22, 23, 24, 30, 34, 35, 36, 55, 58, 60, *66, 73, 76, 77*
Social System	11	8, 25, 26, 27, 28, 29, 32, 57, *67, 69,85*
Comprehensive School	9	6, 7, 12, 13, 14, 16, 38, 51, 52
Vocational Institution	34	2, 3, 4, 5, 10, 11, 15, 17, 33, 37, 39, 40, 41, 43, 44, 46, 47, 48, 49, 53, 54, *68, 70, 71, 72, 74, 75, 78, 79, 82, 83, 86, 87*
Company	8	18, 19, 20, 21, 61, 62, *81, 84*
Education System	5	1, 9, 31, 56, 59
World-of-Work	7	42, 45, 50, 63, 64, 65, *80*
Total number of items	87	

The items in *italics (66-87)* in Table 26 related to the factors in the second phase of the phased model of attractiveness, which is remaining in an education and training program to completion.

The questionnaire structure is represented in Figure 21. Students were asked to tick a box in both columns. The statements in the left column measure the expectations and valuations of the issues and the statements in the right column measure experiences and satisfaction with the corresponding issue.

	strongly important	important	not sure	mildly important	unimportant
When choosing the training sector, information from joint-appilication procedure was for me .					
When choosing training sector, information obtained from VET school written material was for me ..					

	strongly agree	mildly agree	not sure	mildly disagree	strongly disagree
I received sufficient information on training opportunities through joint-application procedure.					
I received sufficient information on my training sector from schools' written material.					

Figure 21. *Questionnaire Structure*

The questions were the same for all the student groups, except the items related to 'staying.' Statements 66-87 in the right column of the questionnaire (the experiences and satisfaction level of the students) were not presented to students in comprehensive schools. Additionally, some forms used other words that were more appropriate for particular student groups. The students also completed a short questionnaire, which contained the following open ended questions:

1. When did you get interested in your current training sector?
2. Why did you get interested in the sector?
3. What work would you like to do in the future?
4. Could you study machinery and metal technology in a VET school?
5. I could study machinery and metal technology in a VET school, if …
6. I do not want to study in the sector, because…
7. I know local industrial companies; yes/no, name three.
8. I know local metal industry companies; yes/no, name three.
9. Describe in your own words what makes the education and training sector/study place attractive.

Questions 1, 2 and 3 assess individual perspectives on attractiveness, particularly personal interest issues. Questions 4, 5 and 6 did not appear on the questionnaire given to students in the machinery and metal technology field. These questions assess the attractiveness of the machinery and metal technology field from the perspective of other student groups. Questions 7 and 8 assess the institutional level, especially knowledge about industrial companies. Question 9 is intended to help define the concept of attractiveness of an educational field (questionnaires given to students in vocational institutions) or concept of attractiveness of a study place (questionnaires given to students in general upper secondary schools and comprehensive schools).

Students also completed a background information questionnaire, which contained the following sections: age, gender, school/institution, educational field,

primary educational choice, application to other fields, earlier education, parents' education, parents' occupation, life style, and distance from residence to school.

The researcher also reviewed other related studies and questionnaires, including Finnish studies by Ahola and Nurmi (1995), Nurmi (1998), Lehtonen (1999), Tiilikainen (2000) and Vuorinen and Valkonen (2003). These were addressed to university and polytechnic students and investigated their educational choices. All used the same bank of questions and modified them according to their research. Ahola and Nurmi (1995) investigated the educational choices of students in higher education. Lehtonen (1999) investigated orientation factors for the educational choices of polytechnic students. Tiilikainen (2000) investigated university students and their reasons for applying to their study place. Vuorinen and Valkonen (2003) investigated the educational choice orientations of university and polytechnic students. The attractiveness of education, however, has not been studied previously. Therefore, the questionnaire used in this research was designed specifically to address the research problem of the present study was not based on earlier questionnaires used in these studies, which were related to educational choices.

Data Collection with Questionnaires, Sample Groups

The choice of target groups was based on who might be possible applicants to attract to education in the machinery and metal technology field? The researcher is interested in the attitudes towards the machinery and metal technology field held by students from machinery and metal technology field and other education fields in vocational upper secondary education who have not chosen the machinery and metal technology field, and the viewpoint of students from general upper secondary schools and comprehensive schools. The target groups along with students in the machinery and metal technology field that were chosen were:

1. students in other fields in the technology and transport sector of vocational upper secondary education,
2. students in non-technical fields in vocational upper secondary education,
3. students in general upper secondary schools,
4. students in comprehensive schools upper level.

Sampling is the process of selecting subjects who are presumed to have some degree of relevance for the particular research question (Denzin 1978). The sample for this research was constructed using stratified sampling with optimal allocation. This means that different stratums use different sampling fractions. (Heikkilä 1998, 37)

The study was conducted in three vocational institutes of Salpaus Further Education which offer education in the machinery and metal technology field: Lahti Vocational Institute, Heinola Institute and Orimattila Institute. The second technical field as well as the non-technical field was chosen together with the head master of each institute. Orimattila Institute and Heinola Institute offer a variety of both technical and non-technical educational programs. From Orimattila Institute and

Heinola Institute it was possible to get students in the aforementioned sample groups 1 and 2. Lahti College of Hospitality represented the non-technical school in the neighbourhood of Lahti Vocational Institute (group 2). The second technical field in Lahti (group 1) was chosen from Lahti Vocational Institute, which offers education only in the transport and technology fields.

General upper secondary schools (group 3) were chosen from separate municipalities in the Lahti Region. Nastopoli Upper Secondary School is a technically oriented general upper secondary school and Heinola Upper Secondary School is a universal general upper secondary school. Comprehensive schools (group 4) were selected from the city of Lahti (Kannas Comprehensive School) and the city of Orimattila.

The population for this study is comprised of three groups in Päijät-Häme: students in vocational institutions, students in general upper secondary schools and students in comprehensive schools. The population in vocational institutions was subdivided into field groups. The number of first year students in vocational education in Lahti Region in 2001 was 1,738, the number of first year students in general upper secondary education was 1,266 and the number of students in comprehensive schools in 9^{th} grade was 2,412 (Alanko et al. 2004). In total, the sample for this study included 736 students. Table 27 shows the number of students in each school or institution in the sample group and the number of and percentage of returned questionnaires.

The questionnaire survey was administered during November-December of 2003. The attached letter is in English in Appendix 4. A delivery and collection style of administration was chosen because the sample groups gathered regularly and were thus easily reached. Another consideration in making this choice was that the response rate is expected to be moderately high with this type of administration. (Saunders et al. 2000, 282.) The researcher had agreed with the head masters of the institutions about the implementation of the survey. The questionnaires were delivered to the institutions and schools to educational managers, head masters, career counselors or teachers.

Table 27. *Number of Students in each Sample Group and Returned Questionnaires*

Institute/ School	Educational Field/ Grade	Number of Students	Returned Questionnaires	Percentage %
Lahti Vocational Institute	Machinery and metal technology (LAIM)	63	54	86
Heinola Institute	Machinery and metal technology (HIM)	12	10	83
Orimattila Institute	Machinery and metal technology (OIM)	15	14	93
Lahti Vocational Institute	Heating, plumbing and ventilation LAIT)	40	31	78
Heinola Institute	Motor vehicles and transport (HIT)	23	21	91
Orimattila Institute	Electrical engineering (OIT)	16	16	100
Lahti College of Social Welfare and Health Care	Health care and social services (LSTO)	101	81	80
Heinola Institute	Hotel and catering (HIO)	46	40	87
Orimattila Institute	Youth and leisure instruction (OIO)	15	15	100
Nastopoli Upper Secondary School	1st grade (NU)	64	64	100
Heinola Upper Secondary School	1st grade (HU)	104	88	85
Kannas Comprehensive School	9th grade (KC)	112	94	84
Orimattila Comprehensive School	9th grade (OC)	125	112	90
Total Number of Questionnaires	-	736	640	87

Overall, 87% of the questionnaires were returned. This was probably due in part to the delivery and collection style of administration of the questionnaires, but also the positive attitudes of school personnel encouraged students to complete them.

The gender distribution of the students in the sample groups is in Table 28. The abbreviations of the institutions, which are used in this research are explained in Appendix 5.

Table 28. *Gender of the Students in Sample Groups in Percentages*

	LAIM	HIM	OIM	LAIT	HIT	OIT	LSO	HIO	OIO	NU	HU	KC	OC
M	91	100	79	94	95	87	10	23	27	59	50	53	47
F	0	0	14	0	5	0	90	77	73	41	48	43	51
Empty	9	0	7	6	0	13	0	0	0	0	2	4	2
	100	100	100	100	100	100	100	100	100	100	100	100	100

The gender of the students studying in technical fields varied from 88% to 100% males and from 0% to 14% females. In non-technical fields in vocational institutes the gender distribution is 10%-27% males and 73%-90% females. This follows the tendencies of gender distribution in vocational education according to national statistics. These statistics are presented in Chapter 3.

Table 29 presents the age distribution of the sample group of students. The ages of the students ranged from 14 to 40 years. In vocational institutions technical fields 70-100% of the students were 16-17 years old. In non-technical fields the age distribution was wider, 63-80%of the students were 16-17 years old. In upper secondary schools 83% of the students were 16 years old and in comprehensive schools 87%of the students were 15 years old.

In 2002 the students from transport and technology sector in Finland were the youngest students that graduated compared to students in other educational programs (Tilastokeskus 2004b). The age distribution in technical fields of this research conforms with this national trend.

Table 29. *Age Distribution of the Students in Percentages*

Age	LAIM	HIM	OIM	LAIT	HIT	OIT	LSTO	HIO	OIO	NU	HU	KC	OC
14	0	0	0	0	0	0	0	0	0	0	0	2	4
15	0	0	7	3	5	13	2	5	0	8	3	84	90
16	44	80	79	71	71	63	47	58	47	79	86	10	4
17	26	20	0	13	24	19	16	23	33	8	5	0	0
18	7	0	7	6	0	6	3	5	7	2	3	0	0
19	11	0	0	0	0	0	9	8	13	2	0	0	0
20	0	0	0	0	0	0	7	2	0	2	0	0	0
21-25	0	0	0	0	0	0	10	0	0	0	0	0	0
26-40	2	0	0	0	0	0	5	0	0	0	0	0	0
empty	9	0	7	6	0	0	0	0	0	0	2	4	2
Total %	100	100	100	100	100	100	100	100	100	100	100	100	100

Analysis of the Questionnaires

Questionnaires were analyzed to identify the contributors to and detractors from the attractiveness of vocational upper secondary education and training in machinery and metal technology.

The questionnaire data was entered into an MS Access database using web-based input. In data-analysis the researcher used MS Access and MS Excel programs. In the first phase, the minimum, maximum, mean and standard deviation of each category of each sample group was calculated. This analysis is presented in Appendix 6. Verification of statements occurred in a subsequent phase.

The second phase of the analysis involved gap-analysis as shown in Figure 22. Analysis of the contributors to and detractors from each factor of attractiveness was conducted for each respondent group data.

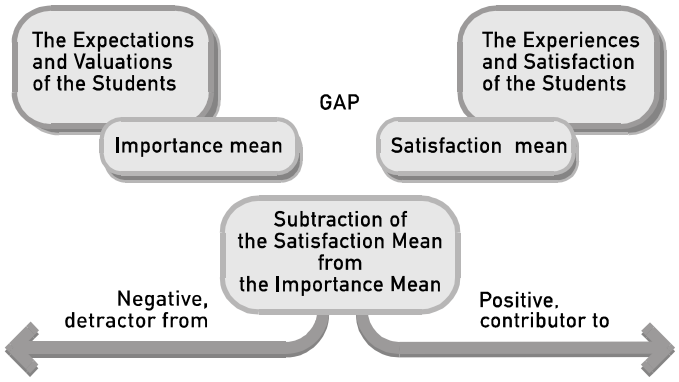

Figure 22. *Gap Analysis Process*

The results of gap analysis are presented in Appendix 8. The results show the gaps of the responses of each respondent group of the most important factors and the least important factors in each element. The gaps that are near or above zero-level are those factors that contribute to attractiveness. The detractors are the factors that have negative values.

The results of gap-diagrams were compared and the contributors to and detractors from attractiveness were determined by these comparisons. The researcher compared the open ended answers on questionnaires to the results of gap analysis and these two data sources determined the final contributors to and detractors from attractiveness of vocational upper secondary education and training in machinery and metal technology. The results of gap analysis are described in detail in Chapter 6.

Analysis of Qualitative Data on Questionnaires

The analysis of open questions in the questionnaires was conducted by collecting data for each respondent group from the MS Access database. The data was then shifted to MS Excel for further quantitative and qualitative analysis. For qualitative analysis the open ended answers were coded and categorized according to the themes that were derived from data. The frequency of occurrence of the key themes was also counted. (Alasuutari 1999, 192).

The analysis concerned the interests of the students, their knowledge about industrial companies and the students' attitudes towards the machinery and metal technology field in vocational upper secondary education and training. The results were used in the determination of contributors to and detractors from attractiveness, elements of attractiveness, the concept of attractiveness as well as the model of attractiveness. The results of the analysis are described in detail in Chapter 6.

Construction of the Model

The construction of the model of attractiveness is based on results of the two sub-questions of the research: What are the elements and factors of attractiveness to students of vocational upper secondary education and training in machinery and metal technology? What factors are most important in contributing to or detracting from the attractiveness to students of vocational upper secondary education and training in machinery and metal technology?

The researcher developed the construction by discovering the relationships of the elements and the various phases in the attractiveness process. The construction phases are introduced in accordance with the results of data analysis.

6 RESULTS OF THE RESEARCH

6.1 Results From the First Phase of Data Collection and Analysis

6.1.1 Results From Students' Short Essays

The short essays by the first year students in machinery and metal technology were written in Lahti Vocational Institute (55 students), Orimattila Institute (19 students) and Heinola Institute (13 students). Altogether 80 short essays were gathered. They were written and analyzed in Finnish.

The first open-ended question for the short essays was: Why did you apply to the machinery and metal technology field? Themes were identified from the content of the data and their frequency counted (Alasuutari 1999, 192). The reasons given in the short essays for applying to machinery and metal technology were the following: an interesting branch, working opportunities in the future, suits me and a long-term wish, friend told, I was unable to obtain another study place, money and earning a good income, father works in metal industry, proximity of the school and further education possibilities.

Table 30. *Frequency Distribution of the Reasons for Application to the Machinery and Metal Technology Program*

Themes in the Short Essays	Number of Responses	%
An interesting sector	46	37.7
Working opportunities in the future	21	17.2
Suits me and a long-term wish	13	10.7
Friend told me	11	9.0
I did not succeed to obtain another study place	10	8.2
Money, earning a good income	9	7.4
Father works in metal industry	6	4.9
Proximity of the school	4	3.3
Further education possibilities	2	1.6
Total	122	100

Table 30 shows that students most commonly apply to an educational program in machinery and metal technology because of the perceived interestingness of the

field. Forty-six responses (37.7%) gave this reason. A further 21 responses (17.2%) cited good working opportunities in the future and 13 responses (10.7%) noted the suitability of metal work and that entering this field of work was a long-term wish for the student. Eleven responses (9.0%) indicated that the students got information about this educational possibility from a friend and 10 responses (8.2%) stated that the student was not able to get another study place. Only 2 responses (1.6%) mentioned that further education possibilities were a motive for their educational choice.

The following quotations represent the themes in the essays. The index at the end of the following quotations describes the institute (H for Heinola Institute, L for Lahti Vocational Institute and O for Orimattila Institute) and the sequence number. The quotations can be found in Appendix 3 in their original form in Finnish.

- *I was about to go work on construction but I heard about metal from a friend; they have a workshop you know. And metal also 'cause I knew what construction was all about, and it wasn't really for me. L1*
- *I heard it's easy to find work in this sector and wages are reasonable. H2*
- *Because my father works in metal and my friends have done this line and I'm also interested in it. L3*
- *They offered it in Orimattila and I like metal work. O4*

The second open-ended question for the short essays was: Why did you choose Lahti Vocational Institute/Orimattila Institute/Heinola Institute as your study place? The themes, which were again derived from the data, are the following: proximity of the school, no other alternatives available, good-quality study place, my friends are studying too or my friends told, to get an occupation/job, I could not obtain another study place.

Table 31. *Frequency Distribution of the Reasons for Choosing a Particular Vocational Institute*

Themes in the Short Essays	Number of Responses	%
Proximity of the school	58	75.3
No other alternatives available	5	6.5
A good-quality study place	4	5.2
My friends are studying too or my friends told	4	5.2
To get an occupation/job	3	3.9
I could not obtain another study place	3	3.9
Total	77	100

The themes in responses to the second question are presented in Table 31. The results show that the most significant reason for choosing a particular institution is that the school is near the student's residence and that there are good transport facilities. Fifty-eight responses (75.3%) highlight the proximity of the school. The

other reasons were not so significant; for example, only 4 students (6.5%) made their decision based on the school's good reputation.

The following quotations represent the themes in the essays.

- *Because it's not that far from home. L5*
- *Because I'd never have got into general upper secondary school, not with my grades, and I like practical work better than theory. L6*
- *My first choice was to become driver but didn't get in. Now I'm happy I got into metal. L7*
- *Because all my friends go to Heinola Institute, too. H8*

The themes in responses to the short essays were considered in the design of the focused interviews and in the questionnaire design as well as in the definition of detractors from and contributors to attractiveness.

6.1.2 Results From the Focused Interviews

The elements and factors of attractiveness of vocational upper secondary education and training in machinery and metal technology in the Lahti Region were derived from interviews of the key informants. The key informants belonged to local and regional stakeholder groups (see Chapter 2).

The next paragraphs discuss the elements and factors of attractiveness, and provide illustrative quotations that characterize each of them. On the basis of the data, the element *Individual* was subdivided into personal factors, structural factors and intra-individual factors. The other elements were each subdivided into structural factors and interaction factors. Structural factors include for instance the curriculum and the infrastructure of the schools and education system. Interaction refers to the relationship between persons and organizations, including exchange of information. Tables 33-37 in Chapter 6.1.3 provide a summary of the elements and factors of attractiveness.

Illustrative quotations from the interviews were translated into English and confirmed as a part of the language checking for this dissertation. The quotations can be found in their original form in Finnish in Appendix 3. The index at the end of the following quotations describe the key informant group: S = student; V = representative from vocational institutions; C = representative from comprehensive schools and E = representative from companies. The quotations are numbered in the order of appearance.

The Individual

The first element of attractiveness derived from the interviews is the *Individual*. This element contains three factor categories, which are personal factors, structural factors and intra-individual factors. Personal factors include age and gender. Struc-

tural factors contain chance of educational and career choice and school success. Intra-individual factors include interest aspects, motivation and attitudes aspects, skills and learning orientation. The following quotations describe the factors within the *Individual* element of attractiveness.

- *Interest means the work is meaningful for you, don't have to do something you aren't interested in. (SQ1)*
- *I got interested over a period of time. (EQ2)*
- *A study place may come as a surprise, think if its your fifth choice and you get in like that. (CQ3)*
- *If you check the background a little, there aren't really very clear profiles for you to find … I'd say there's in fact quite a lot of room for chance there then. (VQ4)*
- *If it's what your hobbies and expectations are, like for instance the vehicles field, then the attractiveness comes from your own personal likes and dislikes. (VQ5)*
- *But it's actually the diploma that decides for most which route to choose. (CQ6)*

The Social System

The element *Social System* describes the people with whom the individual interacts outside of the school system during his/her decision making about educational choices. The stakeholders are family members, acquaintances and peers. The structural factor is the socioeconomic status of the family. Interaction includes encouragement, information and opinions shared between the stakeholders and the individual who is making his/her educational choice. The following quotations describe the factors within the *Social System* element.

- *Got to get away from the parents' back. Old man is kicking my butt saying I've got to find work. Didn't impress me as a sector. Folks haven't really had anything to do with it one way or another. (SQ7)*
- *My dad's in the same field and seeing what he does has sort of made me interested. (SQ8)*
- *And then a father or mother who's been laid off or something, won't say you have to find work there but you've got to find something else. (EQ9)*
- *Someone did say being a trucker is fun and another said it sure isn't. And one says this is a nice job and then again another one says it's not. It's a bit what you happen to hear. (EQ10)*
- *Heard from guys who've graduated from the metal department of this school and in on-the-job training places and about wages in companies. (SQ11)*

Comprehensive School

The element *Comprehensive School* describes the stakeholders, structures and interaction in comprehensive schools. The stakeholders are career counselors, teachers and other students; the structures are the joint-application system and the curriculum. Interaction consists of encouragement, information and opinions from the stakeholders as well as cooperation between the stakeholders and the individual.

- *Our tech teacher has taken a bit of an attitude here that he sort of tries to 'advertise' and keep this vocational education on view. (CQ12)*
- *Career counselors for instance mock vocational institutes, and they have a strong opinion that VET students don't really amount to much. (SQ13)*
- *Career counselors are fairly realistic but they mainly guide you to general upper secondary school. (VQ14)*
- *People think that when comprehensive school is out it's eternal holidays and you don't have to do anything when you come to vocational school, but it's not like that. (SQ15)*
- *Comprehensive school technical studies have either been arranged there (in VET institutes) or our teachers have even given the courses. (VQ16)*
- *But I'm sure there are still teachers who sort of say that if you don't study you'll end up a welder in our company or some place else. (EQ17)*

Vocational Institution

The element *Vocational Institution* describes the stakeholders, structures and interactions in vocational institutions. The stakeholders of the element are career counselors, teachers, other personnel and other students in the institutions. Structures are the reputation and mental images of education and institutions, infrastructure, machines and tools of the institutions, proximity of the institutions, curriculum structure, the joint application system and on-the-job learning. Interaction factors are cooperation between stakeholders, the working climate of the institutions and information about the institutions and the educational opportunities they provide. The following quotations describe the factors within the *Vocational Institution* element.

- *If Vocational Institute here in Lahti did something about the matter, I mean the situation has been for years that really you haven't wanted to take your students to vocational school as you think that then they won't apply there for sure. (CQ18)*
- *It's important that you can get about on foot and that you don't always need a car. (EQ19)*
- *And then you're even interested in the work that comes after the studies. They look forward to on-the-job training. (VQ20)*

- *You study practical things. The sector I can recommend, not the institute. (SQ21)*
- *Studying new things depends on us and our on-the-job training and such. (SQ22)*
- *Should raise the level, selection criteria. Should already start saying at comprehensive school that it's not easy to get in there. (SQ23)*
- *But as the institute has been here for thirty years now, there should have been time for some cooperation by now. (VQ24)*
- *I'm not saying that they don't have the skills or competence, but they haven't had a chance to show them or they've already become underachievers in comprehensive school. So, if the studies were so arranged and structured that they, so to say, had the opportunity to show their competence, which is like what the capacity is. (VQ25)*
- *Well as I said, it all depends how interested you're in it yourself; it's well known that VET schools' reputation is what it is; that everyone thinks that ah, he's done vocational school and is just a bloody worker. (SQ26)*
- *But when you really start to think more about what kind of training they give, then the reputation is good that they are skilled people that come from there, so again there're two sides to the coin and all depends on how you look at it. (SQ27)*

Company

The stakeholders in the *Company* element are the personnel in the companies. The structures include on-the-job learning, TET-periods, summer jobs and other cooperation activities and resources. The interaction factor includes information about cooperation possibilities, information about companies and their products, information about the content of work and the attitudes of enterprises towards educational institutions and their students. The following quotations describe the factors within the *Company* element.

- *So this is like a picture of the problem field here; that they're doing good, I mean these school and labor office people, they all mean well but there's something kind of missing here. (EQ28)*
- *I wish young people could get summer jobs, I mean experience based knowledge is the best. But the situation is unfortunately one where few people find any work and that leads to them not knowing all that much about working life circles. (CQ29)*
- *Got all too few connections and often the case is they say they'll get back to you but actually never do. (EQ30)*
- *This daily routine is part of working life connections and this kind of training cooperation that businesses in the area have. It's of great importance if businesses are active. Sometimes they are, sometimes not. It's all about fluctuations. (VQ31)*

- *There're vacant jobs in the area and that's another important thing, not just any beautiful pictures or pretty words. (VQ32)*
- *… if companies have reservations about young people one way or another. Whether it's a summer job or arranging an on-the-job period or study visits or giving lectures at the school or arranging company/class activities, and if companies don't really get involved in this kind of thing instead of just fancy words, then a lot of that loses all its meaning. (CQ33)*

Education System

The stakeholders in the *Education System* element include the National Board of Education and the Ministry of Education. The structures include the various programs and institutions within the education system, the parity of esteem between vocational education and general education, and coordination of student flows. Interaction includes information about educational routes and possibilities and labor market cooperation activities. The following quotations describe the factors within the *Education System* element.

- *Somebody has the guts to decide not to go to general upper secondary school but sees that this is a good alternative for me and then all the pathways are open. (CQ34)*
- *Finnish system does provide opportunities for almost anything so that it's more a question of making these other factors sync and I think it's more a question of will than something to do with the structures of these systems or subsystems. What's most important is that the student is able to grasp all that. (VQ35)*
- *This whole education structure, in this sense these VET institutions, universities and all these names are already such that you don't understand anything about them. (EQ36)*
- *There have been these changes in the education system. For example there's this opportunity to take the matriculation examination on the side and young people are starting to get an idea of these training routes. (CQ37)*
- *Many people think it's worth going to general upper secondary school, then you get to study. But VET students get jobs. (SQ38)*

World-of-Work

The element *World-of-Work* describes the structures and interaction of working life. The structural factors include business life within the region, the image and reputation of the business sector, employment prospects and wages in the sector. Interaction factors include information about work and the world-of-work. The following quotations describe the factors within the *World-of-Work* element.

- *There was something about the retirement bomb in the news, said it's easy to find work. (SQ39)*
- *And this, this came up at some point that one just should be able to create an understanding in this school world, or is it this world-of-work or the government, that industry is needed and that without industry and export industry in particular, we kind of, we just won't be able to serve one another. (EQ40)*
- *On the other hand companies and like making this field known, the fact that there are job opportunities and regionally there are jobs available, and then again it's important. They sort of add value to attractiveness and not just beautiful pictures or pretty words, but it is how well functioning the environment is and in a way how good it is to work there that adds attractiveness. (VQ41).*
- *Mm, at one point I lived in the street where Metal Co. located, so I saw it every day. Maybe that created an image that this is where I want to be. (EQ42)*

The following quotation is from an interview with a career counselor in a comprehensive school. The quotation describes the awareness about the *World-of-Work* among students in comprehensive schools.

- *Well industrial work isn't, well I mean, it still just is that if I for instance give 8th graders an assignment, it's got many phases, to set up a new town, that what do you need there first, like what services, production plants, what you need there, well very few draw any factories. And when I ask where all the work places are, they say somewhere on the outskirts, we don't want factories. … And then when you start to think about it, about what different work places and workers there are like at police stations, public offices, schools, hospitals. And then finally they place all the students in the class into like jobs or work places or like into professions there. … that they are, they pollute. Who would want to live next to a factory. (CQ43)*

The Elements of the Second Phase of the Attractiveness Process, Remaining in Education and Training for Completion

The focus of this research is on the elements and factors of attractiveness in education and career choice. In the interviews, however, the issues of remaining in education and training for completion arose in discussion and thus the researcher also considered the elements and factors of the second phase of the attractiveness process during the analysis of the interviews.

The researcher concluded that attractiveness of education should be studied in three phases, which are illustrated in Figure 23. The first phase consists of career and educational choice, which is most often understood to comprise the whole phenomenon of the attractiveness of education. The second phase is the phase of education and training in a vocational institute. The third phase is the transition phase from school to occupation and career. The two later phases are often left out of the discussion of attractiveness. This research has also focused mainly on the first phase of the phased model of attractiveness. The second phase is investigated only

partially in terms of some of its main elements and factors. The third phase is left out of this research, because it requires its own research in a subsequent phase into the sources of attractiveness. The circle in Figure 23 illustrates the focus of this research.

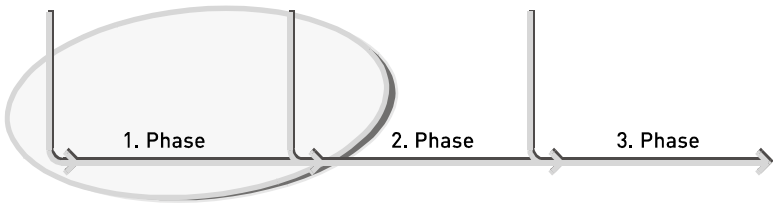

Figure 23. *Phased Model of Attractiveness*

The second phase of the process model of attractiveness concerns the elements and factors that affect students' decision to remain in education and training. The elements describe the activities and circumstances that support the students during their education in order to encourage them to continue to completion. The second phase of the attractiveness process consists of the same elements as the first phase of the attractiveness process: *Individual, Social System, Vocational Institution, Company, Education System* and *World-of-Work*. The factors within each element are presented in Table 37. The following quotations describe the elements and factors of the second phase of the attractiveness process.

- *If you have applied to get into a field that sort of guarantees you stay there. Second and third choices mean you didn't have an alternative and drop out more easily. (VQ44)*
- *Some drop out more easily, it's not about attractiveness but for young guy or girl; when he or she has come, for whatever reasons, they should start giving an insight as to what there is in it for him or her and what you can become and what opportunities there are in the field. (VQ45)*
- *Training didn't interest me when I had to choose, must have time for hobbies. (SQ46)*
- *It's better to have friends as you can see quite a few of those in here too whose studies have gone straight to hell because they haven't had friends. Well, when you don't have friends and everything crashes then you can't take it anymore. (SQ47)*
- *Well, me at least. I think it's still clearer with guys that it's very important that there's kind of, not quite like bodyguards, but kind of safe gang, and every now and then there are some, even local ones, or it's plainest to see when they come from another comprehensive school. (VQ48)*

6.1.3 Summary of the Elements and Factors of Attractiveness

The frequency of occurrence of the various key themes (Alasuutari 1999, 192) in the interviews is reported in Table 32. The frequency count includes both negative and positive references to each theme. The theme *Information* was initially treated as a separate category/element, but in the final categorizing phase the responses within this theme were distributed between the other categories. Nonetheless, the information element has been included in the table because it shows the high frequency of responses concerning various forms of information in discussion of career and educational choices. This final construct was chosen because the other elements consist of factors as structures and interaction. Information is a means to foster interaction between stakeholders within the various elements of attractiveness rather than a separate element in itself. Table xx shows that the themes *Vocational Institution* and *Information* each occurred 100 times in the interviews. The fewest responses (24) occurred within the element Education System.

The element *Vocational Institution* occurred 65 times in the interviews of representatives from vocational institutions and 15 times in the interviews of representatives of companies. The theme *Information* occurred 44 times in the interviews of representatives of comprehensive schools and 41 times in the interviews of representatives of vocational institutions. It is noteworthy that students did not mention the issue of information in their interviews.

Students did not mention the *Education System* element. The other elements (*Individual*, *Social System*, *Comprehensive School*, *Vocational Institution* and *World-of-Work*) were discussed quite equally, 8 to 11 times each. The results from the interviews indicate that the important issues for students when they consider their educational and occupational choices are the stakeholders, structures and interactions on the microlevel and institutional level. However, students also paid attention to the world-of-work on the macrolevel. It is noteworthy that students did not discuss much about individual companies.

Respondents from vocational institutions mentioned the element *Vocational Institution* 65 times and the element *World-of-Work* 20 times. The representatives of comprehensive schools discussed each theme quite equally, between 8 and 14 times each, except for the theme *Information*, which occurred 44 times in the interviews with career counselors. Respondents from companies mentioned the *Individual* and *Education System* elements equally in their discussions, 6 times each.

Table 32. *The Occurrence of Themes in the Interviews of Each Key Informant Group*

Key Informant Group Themes	Students in Vocational Institutions	Representatives from Vocational Institutions	Representatives from Comprehensive Schools	Representatives from Companies	Total Number Of Themes
Individual	10	19	13	6	48
Social System	8	19	14	10	51
Comprehensive School	8	19	13	12	52
Vocational Institution	11	65	9	16	100
Company	2	16	13	14	45
Education System	0	10	8	6	24
World-of-Work	8	20	13	28	69
Information	0	41	44	15	100
Total Number	47	209	127	106	489

Tables 33-37 summarize the elements and factors of attractiveness. The elements are general categories, which contain factors that contribute to or detract from attractiveness.

Table 33. *Elements and Factors of Attractiveness of Vocational Upper Secondary Education and Training in the Microlevel/Individual*

Individual	Personal Factors: age, gender	
	Structural Factors	Intraindividual Factors
	Chance. School success.	Interest aspects. Motivation and attitudes. Skills and learning orientation.

Table 34. *Elements and Factors of Attractiveness of Vocational Upper Secondary Education and Training in the Microlevel/Social System*

Social System	Stakeholders: family, peers, acquaintance	
	Structural Factors	Interaction Factors
	Socioeconomic status.	Encouragement from the stakeholders. Information from the stakeholders. Opinions from the stakeholders.

Table 35. *Elements and Factors of Attractiveness of Vocational Upper Secondary Education and Training in the Institutional level*

Comprehensive School	Stakeholders: career counselors, teachers, other students	
	Structural Factors	Interaction Factors
	Joint application system. Curriculum.	Encouragement from the stakeholders. Information from the stakeholders. Opinions from the stakeholders. Cooperation between the stakeholders and the individual.
Vocational Institution	Stakeholders: career counselors, teachers, other personnel in institutions, other students	
	Structural Factors	Interaction Factors
	Reputation and mental images of education and institutions. Infrastructure of the institutions. Machines and tools in institutions. Proximity of the institution. Curriculum structure. Joint application system. On-the-job learning.	Cooperation between stakeholders and the individual. Working climate of the institution. Information about institutions and educational possibilities.
Company	Stakeholders: personnel in companies, Finnish Metalworkers' Union, Technology Industries of Finland, Confederation of Finnish Industry and Employers	
	Structural Factors	Interaction Factors
	Regional business-life structure. On-the-job learning. TET periods. Summer jobs. Other cooperation activities and resources.	Information about various cooperation possibilities. Information about companies and their products. Information about the content of work. Attitudes of personnel in enterprises towards educational institutions and students.

Table 36. *Elements and Factors of Attractiveness of Vocational Upper Secondary Education and Training in the Macrolevel*

Education System	Stakeholders: National Board of Education, Ministry of Education	
	Structural Factors	Interaction Factors
	Education system structure with various education routes and possibilities. Parity of esteem with general upper secondary education. Coordination of student flows.	Information about education routes and possibilities. Labor market cooperation.
World-of-Work	Stakeholders: Ministry of Labour, Ministry of Finance, Finnish Metalworkers' Union, Technology Industries of Finland, Confederation of Finnish Industry and Employers, Media (newspaper, radio, TV, Internet)	
	Structural Factors	Interaction Factors
	Business life structure of the region. Image and reputation of the business sector. Employment prospects. Wages in the sector.	Information about the world-of-work.

Figure 24 illustrates the elements of attractiveness at various observation levels. The elements are illustrated as arrows, which originate on the macrolevel, institutional level and microlevel. The elements within the various levels are, however, affected by the contexts of lower levels, and that is why the elements are not situated solely on a single observation level.

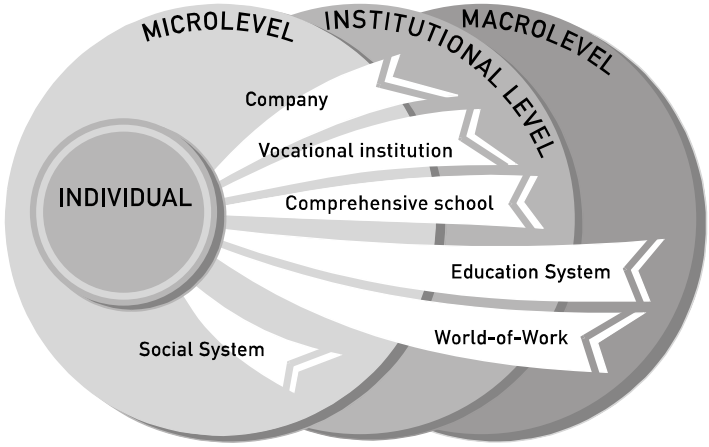

Figure 24. *Elements of Attractiveness on Various Observation Levels*

Table 37 shows the elements and most prominent factors of the second phase of the attractiveness process, remaining in education and training for completion.

Table 37. *Elements and Factors in the Second Phase of Attractiveness Process*

Factors Elements	Structural Factors	Interaction Factors
Individual	Importance of education.	
Social system		Peer and peer group encouragement. Family encouragement.
Vocational institution	Curricula structure. On-the –job learning.	Encouragement of the other students. Information from previous students in the institution.
Company		
Education System		
World-of-Work		Information from business life about the esteem of the occupation.

As a result of the analysis of the short essays and focused interviews the researcher constructed a model for the sources of attractiveness of an educational field in vocational upper secondary education and training. The model can be described as follows. *The attractiveness of an educational field results from three sequential action phases: The first phase is the phase of educational and career choice, the second phase is the process of education and training, and the third phase is the transition from school to occupation. Each phase is affected by 'elements' of attractiveness, which are general categories that contain 'factors' which contribute to or detract from the overall attractiveness of an educational field and career.*

Figure 25 illustrates the three sequential phases and elements of the attractiveness process. The elements in the third phase have not been investigated in this research. The researcher assumes that the elements are the same as in the second phase of attractiveness. The detracting and contributing factors inside these elements have neither been investigated in this research.

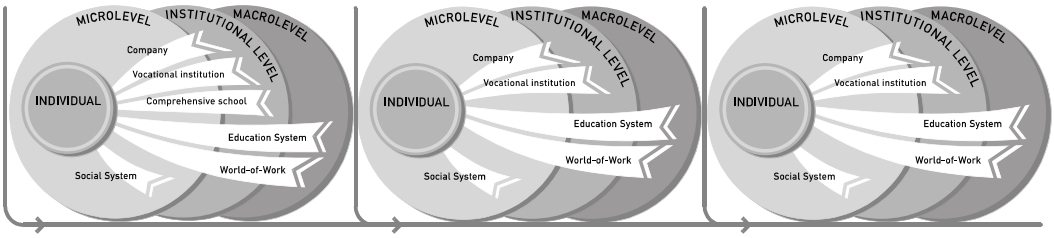

Figure 25. *Three Sequential Phases and Elements of the Attractiveness Process*

The next phase of data collection and analysis examined the detractors from and contributors to the attractiveness of vocational upper secondary education. The following section presents these results.

6.2 Results From the Second Phase of Data Collection and Analysis

The second phase of data collection was conducted using questionnaires with fixed responses and open-ended questions. The questionnaire design is described in Chapter 5. The minimum, maximum, mean and standard deviation were analyzed, they are reported in Appendix 6. The fixed response options in the importance column of the questionnaire ranged from 1-unimportant to 5-strongly important and in the satisfaction column they ranged from 1-strongly disagree to 5-strongly agree.

The purpose of the questionnaire survey was not to understand causal relationships, it was to gain a deeper and wider understanding about the phenomenon. The analysis of the questionnaires was done by calculating the frequency distribution of each item. Gap analysis was used to determine the importance and satisfaction level of each factor. The gap is determined by subtracting the satisfaction mean from the importance mean (Sillanpää & Ålander 2003). The process of gap analysis is described in Chapter 5.

This section presents the results of the frequency distribution and gap analysis and the analysis of the background information and open-ended questions on the questionnaires. The results are presented under each element of attractiveness. Section 6.2.2 provides a summary of the results.

6.2.1 Importance of the Factors and Gap Analysis Results

The frequency distribution for each factor within each element is examined according to the importance of the factor. The frequency distribution contains the responses of all respondent groups. Appendix 7 presents the frequency distribution. The items that were considered unimportant and the items that deviated significantly from the norm are also identified and discussed.

Appendix 8 presents gap analysis results for each respondent group. In the presentation of the results the gap analysis of the respondent groups in machinery and metal technology program are brought up. The conclusions of the detractors and contributors to attractiveness are based upon this analysis. Paragraph 6.2.2 presents the summary of the detractors and contributors to attractiveness, which is based on the gap analysis results and the results from the open-ended questions on the questionnaire along with the results from the short essays and focused interviews.

The results of the gap analysis are discussed in this section after the presentation of the frequency distribution. The open-ended questions on the questionnaires produced qualitative data, which was analyzed using content analysis. The results are presented as frequency distributions of the derived categories and these are discussed after the gap analysis results.

The Individual

Frequency Distribution

- *Interestingness of the education and training sector in the beginning of studies* (Item 55a) was strongly important (29.62) or important (45.38) for 75% of the respondents.
- *Use of practical skills during studies* (Item 22a) was strongly important (22.43) or important (42.18) for 65% of the respondents.
- *Use of theoretical understanding during studies* (Item 23a) was strongly important (11.23) or important (43.04) for 54% of the respondents.

Respondents in general upper secondary schools found it strongly important or important to have good school success (73%, Item 30a) and guaranteed access to an educational program (93%, Item 58a).

The respondents found it unimportant to choose an educational sector that involves their hobbies (24%, Item 24a). The respondents found the results of the occupational choice test unimportant (18%, Item 35a).

Gap Analysis Results

Item 55. The results of the gap analysis of the factor are negative (-0.40, –0.04, -0.62) for each respondent group in the machinery and metal field (LAIM, HIM, OIM). This reveals that interest towards studies has decreased during education and training. The results are consistent with the results for other groups.

Item 22. The results from the gap analysis are zero or negative (-0.02, -0.10, 0) for each respondent group in the machinery and metal field (LAIM, HIM, OIM). This reveals that students have had not enough opportunity use their practical skills in education and training. The results are consistent with the results for other groups.

Item 23. The results of the gap analysis are positive (0.23, 0.80, 1.31) for each respondent group in the machinery and metal field (LAIM, HIM, OIM). The results from Orimattila Institute machinery and metal technology are, however, remarkably positive. The results are consistent with the results for other groups. This reveals that the students feel that they have had sufficient opportunity to use their theoretical knowledge in education and training.

The least important factors within the element *Individual* are Items 35 and 36. The results of the gap analysis for *Item 35* are zero or slightly positive (0.00 in LAIM, 0.10 in HIM, 0.08 in OIM). This shows that the results of occupational tests have had only a minor impact on students' educational choices. The gaps in *Item 36* are both negative and positive (0.36 in LAIM, 0.80 in HIM, -0.23 in OIM). This shows that their studies have been easier that students expected in some cases (LAIM, HIM), but also more difficult than expected in others (OIM).

Interest Towards Educational Choice

Table 38 presents the frequency distribution at the time when the students became interested in their educational field in vocational education or study place in general education. The open-ended question was: When did you become interested in your present educational field/study place?

The results show that most students become interested in their educational field or study place when they are studying in the upper level at comprehensive school. The frequency varies from 23% (HIO) to 71% (OIM). One fifth of the students in the Lahti Vocational Institute machinery and metal technology program (21%) and a smaller proportion in other groups (14% in LAIT, 14% in HIT, 10% in HIO) were not able to determine the time when their interest was aroused.

Ten percent of the students in the Heinola Institute machinery and metal technology program and 14% of the students in the Orimattila Institute machinery and metal technology program became interested in their educational field at the beginning of the studies. Some of the students in the Lahti Vocational Institution heating and plumbing program (11%) and the Heinola Institute motor vehicles and transportation program (9%) became interested in their educational choice at the time of application. Some students in the motor vehicles and transport program (18%,

HIT), health care and social services (21%, LSTO) and hotel and catering (21%, HIO) indicated that they had 'always' been interested in the sector of their educational choice. Some of the students in Heinola Institute machinery and metal technology program (10%) stated that they had never become interested in their educational choice.

All the other respondent groups except students in the Orimattila Institute machinery and metal technology program (OIM) stated reasons that could not be precisely coded into the main categories (from 14%, HU to 40%, LAIM). The responses contained such expressions as: *'last winter',' last spring', 'one year ago'* and *'a couple of years ago'*.

Table 39 shows the frequency distribution of the reasons why the students chose their present educational field in vocational education. The open-ended question on the questionnaire was: Why did you become interested in your present educational field?

On average, 40% of the students in the machinery and metal technology program at the Lahti Vocational Institute and Heinola Institute (LAIM 46%; HIM 40%) and 24% of the students in the Orimattila Institute electrical engineering program were not able to state the reason they became interested in their educational field.

The content of the work (challenging and versatile) was stated to be the reason for interest towards the educational field in most respondent groups: in machinery and metal technology (24% in LAIM, 30% in HIM, 27% in OIM), in other technical fields (24% in LAIT and 41% in OIT) and also in other fields in vocational education (16% in LSTO and 45% in HIO). Students in the health care and social services program and students in the youth leisure instruction program were more precise in their responses, reporting their reason for becoming interested in their present educational field was people oriented work and the opportunity to work with and help other people (39% in LSTO and 27% in OIO). These groups also stated that the work 'suits me' (10% in LSTO and 27% in OIO).

More than half of the students in motor vehicles and transport (57%, HIT) stated their hobby interest in cars was the reason for their interest. The students in heating, plumbing and ventilation (LAIT, 32%) stated that good wages were the reason for their interest, and they also appreciated that there would be workplaces in their occupational sector in the future (22%).

Relatives in the same occupational sector or information received from relatives were sometimes stated as the reason for interest in technical sectors (10% in HIM, 13% in OIM and 12% in OIT). Friends and their effect were not reported significantly.

The factors from education and training were not prominent in the responses. The comments *'something must be chosen,' 'no other admittance,' 'quality or interestingness of education and training'* and '*experiences from TET-periods'* were infrequent, from 0% to 10%.

Students in technical programs (10% in HIM, 20% in OIM and 17% in HIT) gave a variety of other uncategorized reasons for their interest; for example, *'I think I can do this work,' 'I'll get an occupation,'* and *'I can use practical skills.'* Students in other fields in vocational education also reported a range of unique reasons

(17% in HIO and 33% in OIO); for example, *'I have wanted this ever since I was a child,' 'I think I can manage in this work,'* and *' I thought it would be fun.'*

The reasons why students in general upper secondary schools and comprehensive schools became interested in their present or intended study place were different from the reasons given by students in vocational institutions (Table 40). In comprehensive schools a significant number of students were not able to describe the reasons for their interests (31% in and 22% in OC). It should be noted that their joint-application for secondary education and training occurred some 2-3 months after they completed the questionnaire survey.

Interestingness of the intended study place was the main reason for the interest of the students in comprehensive schools (21% in KC and 28% in OC). The proximity of the school was noted by 14% of the students in Heinola general upper secondary school. In Nastola general upper secondary school, (NU) the proximity of the school was the most significant reason for 31% of the students. Other reasons were that the school had been recommended (12%) and it had a reputation for providing good quality education (11%).

Students at general upper secondary schools and comprehensive schools gave many unique responses that could not be coded within the main categories. The frequency distribution for these single responses varied from 22% (NU) to 48% (HU) at general upper secondary schools and from 24% (KC) to 25% (OC) at comprehensive schools. Examples of these single responses are: *'I did not want to go to vocational upper secondary institution,' 'good wages,'* and *'I am good at theoretical subjects.'*

Table 38. *Point of Time When Students Became Interested in Their Educational Field/Study Place*

Respondent Groups Point of Time	LAIM	HIM	OIM	LAIT	HIT	OIT	LSTO	HIO	OIO	HU	NU
Empty. Cannot Say	20.75	0	7.14	14.29	13.64	6.25	2.44	10.26	0	6.98	3.23
Upper Level at Comprehensive S.	33.96	50.00	71.42	46.43	31.82	50.00	32.93	23.07	53.33	55.82	66.13
of whom in the 9th grade	*18.87*	*10.00*	*50.00*	*25.00*	*4.55*	*31.25*	*14.63*	*7.69*	*33.33*	*15.12*	*33.87*
Lower Level at Comprehensive S.	0	0	0	0	4.55	0	4.88	5.13	0	8.14	1.61
In the Beginning of the Studies	0	10.00	14.29	0	0	0	0	2.56	0	0	0
At Comprehensive School	0	0	0	3.57	0	12.5	2.44	12.82	0	4.65	1.61
When Applying to Education	5.66	0	7.14	10.71	9.09	12.5	2.44	0	0	2.33	1.61
Always	0	0	0	0	18.18	0	20.73	20.51	6.67	6.98	4.84
Never	0	10.00	0	0	0	0	2.44	0	6.67	1.16	0
Other	39.62	30.00	0	25.00	22.73	18.75	31.71	25.64	33.33	13.95	20.97
Total %	100	100	100	100	100	100	100	100	100	100	100

Table 39. *Reasons Why Students Became Interested in Their Present Educational Field in Vocational Education*

Respondent Groups Reason Type	LAIM	HIM	OIM	LAIT	HIT	OIT	LSTO	HIO	OIO
Empty. Cannot Say	46.30	40.00	13.33	16.22	17.39	23.53	5.21	14.29	6.67
Content of the Work	24.07	30.00	26.67	24.32	8.70	41.18	15.63	45.24	0
People Oriented Work	0	0	0	0	0	0	38.54	0	26.67
Suits me	0	0	0	0	0	0	10.42	0	26.67
My Hobby	0	0	0	0	56.52	5.88	0	0	0
Good Wages	3.70	0	0	32.43	0	0	0	0	0
Workplace in the Future	3.70	10.00	6.67	21.62	0	5.88	5.21	2.38	0
Relatives told/are Working in the Sector	3.70	10.00	13.33	5.41	0	11.76	6.25	9.52	0
Friends Told/are Studying too	3.70	0	6.67	0	0	0	0	0	0
Something Must be Chosen	1.85	0	6.67	0	0	0	0	9.52	0
No Other Admittance	5.56	0	6.67	0	0	5.88	1.04	0	0
Education and Training	1.85	0	0	0	0	0	7.29	0	0
TET-period Experiences	0	0	0	0	0	0	3.13	2.38	6.67
Other	5.56	10.00	20.00	0	17.39	5.88	7.29	16.66	33.34
Total %	100	100	100	100	100	100	100	100	100

Table 40. *Reasons Why Students Chose Their Present/Intended Education Place*

Respondent Groups Reason Type	HU	NU	KC	OC
Empty. Can not Say	8.70	6.32	31.00	22.31
Interestingness	0	0	21.00	28.10
Hobby	0	0	4.00	4.13
People Oriented Work	0	0	2.00	4.13
Relatives Told/ are Working in the Sector	2.61	0	9.00	2.48
Friends Told/ are Studying Too	0	5.26	2.00	0.83
Good Quality Education	0	10.53	0	0
Good Further Education Possibilities	9.57	4.21	5.00	1.65
The School was Recommended	2.61	11.58	0	0
Proximity of the School	13.91	30.53	0	2.48
More Time to Think	6.96	2.11	0	0
I Wanted to General Upper Sec School	7.83	7.37	0	0
I Have Heard/Career Counselor Told	0	0	2.00	9.09
Other	47.83	22.11	24.00	24.79
Total %	100	100	100	100

The Social System

Frequency Distribution

- *Encouragement from parents* (Item 25a) was strongly important (27.01) or important (38.70) for 66% of the respondents.
- *Acquaintance in the same occupational sector* (Item 26a) was strongly important (9.64) or important (38.23) for 48% of the respondents.
- *Opinions of parents* (Item 29a) were strongly important (12.34) or important (33.54) for 46% of the respondents. 17% of the respondents considered the opinions of parents unimportant.

Many respondents found it unimportant to choose the same occupation as their parents (19%, Item 27a), one third (34%) found the opinion of peers to be unimportant (Item 57a) and nearly half (44%) found it unimportant that parents visit parent evenings at comprehensive schools (Item 8a).

Gap Analysis Results

Item 25. The results of the gap analysis are positive (0.32 LAIM, 0.70 HIM, 0.54 OIM). This shows that students have had encouragement from their parents in their educational choices. The results are consistent with other respondent groups, expect those from comprehensive schools, which have negative gaps.

Item 26. The results of the gap analysis are positive (0.74 in LAIM, 0.80 in Him and 1.23 in OIM). This shows that students have acquaintances in the same occupational field. The results are consistent with other respondent groups in vocational institutes, but groups in general upper secondary schools and comprehensive schools have slightly positive gaps.

Item 29. The results of the gap analysis are negative (-0.32 in LAIM, -0.80 in HIM, -0.77 in OIM). This shows that the opinions of the parents have not had a significant impact on the students' educational choices. The results are consistent with other respondent groups.

The least important factors within the element *Individual* are Items 57 and 8. The results of the gap analysis for *Item 57* are negative or slightly positive (-0.04 in LAIM, -0.50 in HIM, 0.08 in OIM). This shows that the opinions of friends have not had a significant impact on students' educational choices. The results are consistent with the results of other respondent groups. The results of the gap analysis for *Item 8* are remarkably positive (0.96 in LAIM, 1.10 in HIM and 0.85 in OIM). This shows that parents have attended parent evenings at comprehensive schools. The results are consistent with the results of other respondent groups.

Familiarity With Parents' Education and Occupation

The background information supplied by students about their father's and mother's education showed that many were not familiar with their parents' educational background and occupation. Table 41 shows the frequency of the answers 'I do not know' (d) and 'I do not know and empty' (d&e) in each respondent group.

Lack of familiarity about father's education varied between 9.1% and 43.8% (d) and between 14.8% and 52.1% (d&e). The greatest lack of familiarity about father's education was among students in vocational upper secondary institutions (HIT, OIM) and comprehensive school (KC). The least was among general upper secondary school students (HU).

Lack of familiarity about mother's education varied between 9.7% and 50.0% (d) and between 9.8% and 57.1% (d&e). The greatest lack of familiarity about mother's education was among students in vocational upper secondary institutions machinery and metal technology program (HIM, OIM) and the least was among students in other programs in vocational institutions (LSTO).

Lack of familiarity about father's occupation varied between 0 and 12.5% (d) and between 11.1% and 48.1% (d&e). The greatest lack of familiarity about father's occupation was among students in vocational upper secondary education

(OIT) and the least was among the students in several schools and institutions (HIM, LAIT, HIT, HIO, OIO, NU).

Table 41. *Familiarity With Parents' Education and Occupation*

Respondent Group	Percentage of Students Reporting They Do Not Know (d) or Do Not Know & Empty (d&e)							
	Father's Education		Mother's Education		Father's Occupation		Mother's Occupation	
	d	d&e	d	d&e	d	d&e	d	d&e
LAIM	22.2	42.6	20.4	40.7	5.6	48.1	5.6	48.1
HIM	40.0	40.0	50.0	50.0	0	50.0	10.0	70.0
OIM	35.7	42.9	50.0	57.1	7.1	28.6	7.1	50.0
LAIT	16.1	29.0	9.7	22.6	0	19.4	6.5	32.2
HIT	23.8	23.8	19.0	33.3	0	42.9	0.0	42.9
OIT	43.8	43.8	31.3	31.3	12.5	31.3	25.0	43.8
LSTO	13.4	18.3	9.8	9.8	4.9	22.2	4.9	13.6
HIO	20.0	27.5	17.5	20.0	0	15.0	0.0	17.5
OIO	13.3	26.7	13.3	20.0	0	20.0	0.0	13.3
HU	9.1	14.8	14.8	21.6	4.5	22.7	3.4	20.5
NU	17.5	20.6	12.7	12.7	0	11.1	4.8	20.6
KC	37.2	52.1	33.0	47.9	6.4	28.7	8.5	27.7
OC	28.6	34.8	26.8	32.1	5.4	14.3	8.0	17.0

Lack of familiarity about mother's occupation varied between 0 and 25.0% (d) and between 13.6% and 70.0% (d&e). The greatest lack of familiarity about mother's occupation was among students in vocational upper secondary education (OIT) and the least among students in vocational institutions in Heinola and Orimattila (HIT, HIO, OIO).

Comprehensive School

Frequency Distribution

- *Information about education and training sector from career counselors* (Item 6a) was strongly important (12.60) or important (43.94) for 57% of the students.
- *Equal information about education and training opportunities* (Item 52a) was strongly important (11.45) or important (41.34) for 53% of the students.
- *Lessons by representatives of different occupational sectors* (Item 16a) were strongly important (10.28) or important (39.72) for 50% of the respondents.

For 26 % of the respondents, visits to companies with career counselors were unimportant (Item 13a). Some respondents found it unimportant to visit companies with their teachers (24%, Item 12a). Approximately one-third of the respondents (29%) found information about the business life of the region to be unimportant (Item 7a).

Gap Analysis Results

Item 6. The results of the gap analysis are both positive and negative (0.19 in LAIM, -0.20 in HIM, 0.69 in OIM). This shows that some respondent groups have received sufficient information about their educational program from career counselors in comprehensive schools (LAIM, OIM), and others have not received enough information (HIM). The results from the other respondent groups also vary widely.

Item 52. The results of the gap analysis are both positive and negative (-0.11 in LAIM, 0.30 in HIM, 0.08 in OIM). This shows that information about educational possibilities provided by career counselors in comprehensive schools is relatively unbiased or slightly biased. The results are consistent with the results of other respondent groups.

Item 16. The results of the gap analysis are positive (0.19 in LAIM, 0.10 in HIM, 0.54 in OIM). This shows that representatives from various occupational sectors have delivered lessons at comprehensive schools. The results from the other respondent groups vary.

The least important factors within the element *Comprehensive School* are Items 12 and 7. *Item 12.* The results of the gap analysis are both positive and negative (-0.13 in LAIM, 0.30 in HIM, 0.08 in OIM). This shows that students in comprehensive schools have visited companies with their teachers (positive gap) and that other students have not (negative gap). The results from the other respondent groups also vary. The results of the gap analysis for *Item 7* are positive (0.21 in LAIM, 0.40 in HIM, 0.31 in OIM). This shows that students have received more information about regional business life than they had expected. The results from the other respondent groups vary.

Vocational Institution

Frequency Distribution

- *Professionally skilled teachers* (Item54a) were strongly important (16.4) or important (46.50) to 63% of the respondents.
- *Well-structured educational program* (Item 46a) was strongly important (10.51) or important (45.22) to 56% of the respondents.
- *Esteem of the given education and training of school/institution* (Item 3a) was strongly important (8.98) or important (45.98) to 55% of the respondents.

- *Safe environment in school/institution* (Item 49a) was strongly important (15.95) or important (37.96) to 54% of the respondents.
- *Information from printed material of schools/institutions* (Item 2a) were strongly important (10.73) or important (42.43) to 53% of the respondents.
- *Good premises of the school/institution* (Item 47a) were strongly important (10.85) or important (40.67) to 52% of the respondents.
- *High quality performance of the school/institution* (Item 44a) was strongly important (9.68) or important (40.16) to 50% of the respondents.
- *Good educational equipment and devices* (Item 48a) was strongly important (13.04) or important (34.50) to 48% of the respondents.
- *Proximity of the school/institution* (Item 39a) was strongly important (12.38) or important (29.84) to 42% of the respondents. 18% of the respondents found proximity of the school unimportant.

More than half of the respondents (56%) found it unimportant to be familiar with the teachers of their intended study place beforehand (Item 40a). Approximately one-third of the respondents (29%) found educational fairs unimportant as a source of information (Item 11a), one-third (29%) found good food at the school unimportant (Item 53a) and one-third (27%) found information on the web pages of schools/institutions unimportant (Item 10a).

Gap Analysis Results

Item 54. The results of the gap analysis are positive (0.42 in LAIM, 1.10 in HIM, 0.31 in OIM). This shows that the professional skills of the teachers are better than students expected. The results are consistent with the results of other respondent groups. The positive values vary between 0.02 and 1.10. Three negative gaps vary between –0.33 and –0.07.

Item 46. The results of the gap analysis are both positive and negative (0.47 in LAIM, -0.10 in HIM, 0.54 in OIM). The positive gaps show that education and training comprise a well-ordered entity. The responses of other respondent groups also vary from slightly negative to positive values.

Item 3. The results of the gap analysis are positive (0.43 in LAIM, 0.30 in HIM, 0.23 in OIM). This shows that the students consider that their educational institution is more esteemed than they expect. The results from other respondent groups vary from slightly negative gaps to positive gaps.

The least important factors within the element *Vocational Institutions/General Upper Secondary Schools* are Items 43 and 40. The results of the gap analysis for *Item 43* are positive (0.68 in LAIM, 0.60 in HIM, 0.92 in OIM). This shows that students feel that youth and adult education should be kept distinct from each other. The results from other respondent groups are consistent, except the gap for students in youth and leisure instruction. The results of the gap analysis for *Item 40* are partly positive and partly negative (-0.13 in LAIM, -0.60 in HIM, 0.38 in OIM).

The positive gap shows that students were acquainted with the teachers in their intended educational institution beforehand.

Attitudes Towards The Machinery and Metal Technology Program in Vocational Upper Secondary Education And Training

The question on the questionnaire was: Could you study machinery and metal technology in vocational upper secondary institution? Table 42 shows the students' readiness to study in the machinery and metal technology program. The readiness varied between 19% and 63%. The lowest readiness was expressed by respondents at general upper secondary schools (23% in HU and 19% in NU) and the highest by students in the motor vehicles and transport program (62% in HIT) and electrical engineering program (63% in OIT) at vocational upper secondary institutions.

Table 42. *Readiness to Study in Machinery and Metal Technology Program*

Readiness Respondent Group	Yes %	No %	Yes/No %	Empty %	Total %
LAIT	45	39	3	13	100
HIT	62	38	0	0	100
OIT	63	31	0	6	100
LSTO	26	74	0	0	100
HIO	38	62	3	0	100
OIO	40	53	0	7	100
HU	23	73	2	2	100
NU	19	81	0	0	100
KC	24	70	1	4	100
OC	31	68	0	1	100

The open-ended questions on the questionnaire continued: 'I could study machinery and metal technology at a vocational institution, if…' The results are presented in Table 43. Students from other educational fields were not able to describe the reasons for their studies in the machinery and metal technology sector. The largest frequency distribution for 'empty' and 'can not tell' responses was within the respondent groups in technical programs at vocational institutions (73% in LAIT, 57% in HIT and 37% in OIT).

Students in technical programs at Heinola and Orimattila stated that they would study machinery and metal technology if they were not studying in their present education program (14% in HIT and 13% in OIT) or if they could not get another study place (19% OIT).

Students in other programs at vocational institutions stated that they would study machinery and metal technology if they were interested in that program (36% in LSTO, 37% in HIO and 25% in OIO). Some students in the youth and leisure

instruction program stated (13%) that they would study machinery and metal technology *'if I were a man'*.

Some students also had unique reasons that could not be coded into the main categories. The frequencies varied from 5% in HIT to 29% in HIO. These responses were for instance: '*if there were more girls,' 'if I had to,' 'if I were not afraid of big machines,' 'if the atmosphere were good,' 'if it were social work,'* and *'if this program were not ok.'*

Table 44 presents the responses of the respondents in general upper secondary schools and comprehensive schools. Many of the students could not describe the reason why they would study machinery and metal technology. The frequencies varied between 26% (HU) and 51% (NU) at general upper secondary schools and between 42% (OC) to 46% (KC) at comprehensive schools.

Some students stated that they would study machinery and metal technology if they were interested (29% in HU, 27% in NU, 17% in KC and 22% in OC).

The unique reasons for studying machinery and metal technology under the category 'Other' were for instance: *'if my life had no purpose,' 'if there was a separate class for girls,' 'if I had practical skills,' 'if it were not such heavy work,' 'if it were not technical,' 'if my parents let me,' 'if I could get matriculation examination at the same time'* and *'if there were more girls.'*

Table 43. *Reasons to Study Machinery and Metal Technology, Vocational Institutes*

Respondent Group Reason type	LAIT	HIT	OIT	LSTO	HIO	OIO
Empty, Can Not Tell	72.73	57.14	37.50	37.04	26.32	18.75
No Admission to the Present Education	3.03	14.29	12.50	3.70	2.63	0
No Admission to Another Study Place	0	0	18.75	3.70	5.26	0
No Knowledge About Another Study Place	6.06	4.76	0	0	0	0
If I Were Interested	9.09	9.52	12.50	35.80	36.84	25.00
If I Were A Man	0	0	0	1.23	0	12.50
Better Wages	3.03	0	0	1.23	0	0
Never	0	9.52	6.25	3.70	0	18.75
Other	6.06	4.76	12.50	13.58	28.95	25.00
Total %	100	100	100	100	100	100

Table 44. *Reasons to Study Machinery and Metal Technology, Comprehensive Schools and General Upper Secondary Schools*

Respondent Group Reason Type	HU	NU	KC	OC
Empty, Can Not Tell	25.29	50.79	45.92	42.11
No Admission to Another Study Place	3.45	3.17	1.02	6.14
No Knowledge About Another Study Place	0	0	5.10	2.63
If I Would Not Apply To General Upper Sec Educ	0	0	2.04	2.63
If I Were Interested	28.74	26.98	17.35	21.93
If I Were A Man	3.45	1.59	3.06	1.75
If I Were Better At It	3.45	0	3.06	0
I Cannot/I Don't Understand the Work	0	0	4.08	1.75
Better Wages	4.60	3.17	0	0
Never	11.49	0	6.12	3.51
Other	19.54	14.29	12.24	17.54
Total %	100	100	100	100

The open-ended question on the questionnaire continued: 'I would not study machinery and metal technology at a vocational institution, because…' Table 45 gives the frequency distribution of the coded open-ended questions.

Many of the students in respondent groups were not able to give reasons why they would not study machinery and metal technology. The frequency varies from 13% (LSTO) to 57% (LAIT). The most often stated reason is that the educational field *'is not interesting/does not suit me/is not my thing'* (23% in LAIT, 24% in HIT, 29% in OIT, 64% in LSTO, 41% in HIO, 63% in OIO, 56% in HU, 50% in NU, 50% in KC and 53% in OC).

The belief that this is men's work is the reason for a small group of students in non-technical programs in vocational education and in comprehensive school (KC) not being interested. The belief that it is hard dirty work is the reason given by a small number of students. Students in technical sectors (10% in LAIT, 10% in HIT and 12% in OIT) consider machinery and metal technology work boring.

Students in hotel and catering programs (HIO) gave several unique reasons, such as: *'I could not do anything,' 'too vocational style,'* and *'I do not want to.'*

Table 45. *Reasons Not to Study Machinery and Metal Technology in Vocational Upper Secondary Education and Training*

Respondent Group Reason type	LAIT	HIT	OIT	LSTO	HIO	OIO	HU	NU	KC	OC
Empty. Cannot Say	56.67	47.62	41.18	13.04	21.95	18.75	25.00	20.31	29.07	23.28
Not Interesting/Does Not Suit Me/Not My Thing	23.33	23.81	29.41	64.13	41.46	62.5	55.69	50.00	50.00	53.45
I'm Studying in the Current Study Place/Program	6.67	9.52	0	0	0	0	0	0	0	0
Low Wages	0	0	5.88	0	0	0	0	3.13	1.16	0
Men's Work	0	0	0	6.52	7.32	6.25	3.41	1.56	0	0.86
Hard Work	0	0	5.88	2.17	0	0	2.27	1.56	0	1.72
Dirty Work	0	0	0	0	0	0	0	0	3.49	1.72
Boring Work	10.00	9.52	11.76	1.09	0	0	2.27	3.13	3.49	4.31
I Do not Understand It	0	0	0	1.09	0	0	2.27	3.13	9.3	2.58
Not Person Oriented Work	0	0	0	4.35	0	6.25	0	0	0	0
I'll go to General Upper Secondary School	0	0	0	0	0	0	0	0	1.16	2.59
Never	0	0	0	0	0	0	2.27	14.06	0	0
Other	3.33	9.25	5.88	7.61	29.27	6.25	6.82	3.13	2.33	9.48
Total %	100	100	100	100	100	100	100	100	100	100

Students in vocational institutes were asked 'What makes an education field attractive?' The results are presented in Tables 46 and 47. Students in comprehensive schools and general upper secondary schools were asked 'What makes a study place attractive?' Table 48 presents these results.

The comments by students about the attractiveness of an educational field in technical programs and other fields in vocational upper secondary education and training are similar to the reasons why they chose their educational field. 'Content of the work' is the primary reason given by students in all technical programs, but many students are not able to describe what makes an educational field attractive. Good wages is important to students in at he heating and plumbing and ventilation program (LAIT). Students in the Orimattila machinery and metal technology program (OIM) also raise the issue of school and education and training as a source of attractiveness.

The comments by students in non-technical fields in vocational upper secondary education and training are also similar to the reasons why they chose their educational field. People-oriented work is the main reason for attractiveness to those in the health care and social services program (LSTO) and students in the youth and leisure instruction program (OIO). Content of the work is important, as is work in the future, and education and school. Fifty-eight percent of the students in the hotel and catering services program cannot say what makes an educational field attractive.

Students in general upper secondary education indicated that the atmosphere of the school was a major source of attractiveness. Also, good premises and good teachers and teaching contributed to attractiveness for some students.

Students in comprehensive schools also appreciated the good atmosphere of a school as well as good teachers and teaching. They also mentioned interest in the topic as a reason for their attraction to a study place.

Table 46. *Attractiveness of the Educational Field, Technical Fields in Vocational Institutes*

Respondent Group Reason type	LAIM	HIM	OIM	LAIT	HIT	OIT
Empty, Can Not Tell	44.26	50.00	21.43	21.43	23.81	41.18
Content of the Work	22.95	33.33	42.86	16.67	71.43	35.29
Extrinsic Rewards, Good Wages	9.84	8.33	7.14	30.95	0	0
Work in the Future	11.48	0	0	19.05	0	5.88
Education, Schools	6.56	0	21.43	9.52	0	5.88
Not Interested	1.64	8.33	7.14	0	0	0
Other	3.28	0	0	2.38	4.76	11.76
Total %	100	100	100	100	100	100

Table 47. *Attractiveness of the Educational Field, Non- Technical Fields in Vocational Institutes*

Respondent Group Reason Type	LSTO	HIO	OIO
Empty, Can Not Tell	11.29	58.33	13.64
Content of the Work	16.13	13.33	18.18
People Oriented Work	24.19	1.67	27.27
Education, School	12.90	5.00	22.73
Work in the Future	12.10	0	0
Interestingness	12.90	6.67	0
Further Education	4.03	0	0
Other	6.45	15.00	18.18
Total %	100	100	100

Table 48. *Attractiveness of the Study Place, Comprehensive Schools and General Upper Secondary Schools*

Respondent Group Reason Type	HU	NU	KC	OC
Empty, Can Not Tell	13.74	9.01	25.62	15.59
Climate	18.32	22.52	15.70	12.90
Good Teachers/Teaching	7.63	16.22	14.05	15.05
Good Premises	7.63	19.82	3.31	7.53
Good Alternatives in Education	9.92	6.31	0	0
Good Friends	5.34	5.41	4.13	4.30
Environments of the School	0	0	0	4.30
Proximity of the School	9.16	3.60	1.65	6.99
Further Education Possibilities	7.63	1.80	0	5.38
Good Working Environments	0	3.60	0	0
Good Occupation in the Future	3.05	0	0	0
Good Earnings in the Future	0	0	3.31	1.61
Positive Feedback of The Study Place	0	0	1.65	2.69
Interestingness	0	0	13.22	9.14
Other Reasons	17.56	11.71	17.36	14.52
Total %	100	100	100	100

Company

Frequency Distribution

- *Positive attitude of companies towards young* (Item 62a) was strongly important (14.67) or important (32.7) to 47% of the respondents.
- *Experiences from summer jobs* (Item 61a) were strongly important (10.37) or important (22.65) to 33.02% of the respondents. 22% of the respondents found the item unimportant.
- *Information about local companies* (Item 20a) was strongly important (3.48) or important (26.54) to 30% of the respondents. 27% found the item unimportant.
- *Information on occupations from companies* (Item 21a) was strongly important (5.23) or important (24.56) to 30% of the respondents. 19% found the item unimportant.

Approximately one-third of the respondents found information about companies in local newspapers unimportant (29%, Item 18a). Half of the respondents found information about companies in local radio unimportant (51%, Item19a).

Gap Analysis Results

Item 62. The results of the gap analysis vary from slightly positive to slightly negative (0.17 in LAIM, -0.10 in HIM, 0.15 in OIM). The positive results show that students consider the companies in the educational sector to have positive attitudes towards young people. The results from other respondent groups are similar. Respondent groups in the general upper secondary schools have distinctly positive gaps (0.73 in NU, 0.61 in HU).

Item 61. The results of the gap analysis are negative (0.34 in LAIM, -0.10 in HIM, -0.69 in OIM). This shows that students have not had summer jobs in their occupational sector. The results from other respondent are also negative, except for students in general upper secondary schools, who show distinctly positive gaps (1.48 in NU, 1.49 in HU).

Item 20. The results of the gap analysis are zero vary from slightly positive to slightly negative (0.15 in LAIM, -0.20 in HIM, 0 in OIM). The positive result shows that students have received more information about the business life of the region in the application phase than they had expected. The results from other respondent groups have corresponding are similar. The exceptions are students in general upper secondary schools (1.19 in NU, 0.80 in HU) and the electrical engineering program (1.00 in OIT).

The least important factors within the element Company are Items 18 and 19. The results of the gap analysis for Item 18 are negative (-0.28 in LAIM, -0.50 in HIM, -0.23 in OIM). The results show that students do not follow news about companies in local newspapers. The results from other respondent groups are

similar, except for students in general upper secondary schools, whose results are slightly positive (0.13 in NU, 0.07 in HU). The results of the gap analysis for Item 19 vary from slightly positive to slightly negative (0.04 in LAIM, -0.20 in HIM, -0.08 in OIM). The negative results show that students do not follow news about companies on local radio. The results from other respondent groups are also negative, except one group in general upper secondary school (0.13 in NU).

Familiarity with Industrial Companies

Table 49 shows the students' familiarity with industrial companies in the region and Table 51 shows their familiarity with metal industry companies in the region. Students in the Orimattila machinery and metal technology program (OIM) and students in Nastopoli general upper secondary school are most familiar with industrial companies in the region (79% and 76%). Students in the motor vehicles and transportation program (HIT) and students in the youth and leisure instruction program (OIO) have limited knowledge about industrial companies (10% and 13%).

Table 49. *Familiarity With Industrial Companies in the Region*

Respondent Group	Familiar With Industrial Companies %	Not Familiar With Industrial Companies %	Empty %	Total %
LAIM	61	31	7	100
HIM	40	60	0	100
OIM	79	14	7	100
LAIT	29	65	6	100
HIT	10	76	14	100
OIT	50	38	13	100
LSTO	43	53	4	100
HIO	35	65	0	100
OIO	13	87	0	100
HU	48	49	3	100
NU	76	24	0	100
KC	47	48	5	100
OC	63	34	3	100

Students were asked to name three industrial companies. In Table 50 the responses were summarized by respondent groups in the regions: Lahti (LAIM, LAIT, LSTO, KC) altogether 260 students, Heinola (HIM, HIT, HIO, HU) altogether 159 students, and Orimattila (OIM, OIT, OIO, OC) altogether 157 students. The region of Nastola is shown separately, because the responses from the students in Nastopoli General Upper Secondary School (NU, 64 students) were quite different. They showed more familiarity with industrial companies than

students in other regions. Also, students in the Orimattila region are more familiar with industrial companies than students in other regions.

Table 50 shows that four to six companies in the region are the best known among the students. In Lahti the most frequently mentioned companies produce food supplies (Hartwall, Oululainen) and furniture (Asko, Isku). In Heinola, Stora Enso produces packaging materials, Vierumäen teollisuus is a timber manufacturing and wood-processing company, Kuusakoski is a recycler of metal-based products and UPM Kymmene produces plywood. In Orimattila, Keraplast produces plastics, Orfer produces metal components and automation, Virke is a textile and clothing industry company, Ferroplan manufactures conveyors and conveyor systems, Ormax (Lafarge Tekkin) produces roofing products and Erteline is a manufacturer of special furniture. In Nastola, Uponor, Wipak and Suominen are plastics manufacturers, Novart is a furniture manufacturer, Levypyörä produces components for machine manufacturers, and Raute is a manufacturer for wood products industry.

Altogether 275 names of industrial companies were given by respondents in Lahti (260 students), and 148 students had no response. In Heinola (159 students) 151 names were given and 97 students had no response. In Orimattila (157 students) 313 names were given and 58 students had no response. In Nastola (64 students) 133 names were given and 15 students had no response. Thus, in Orimattila and Nastola the number of responses were double those from students in Lahti and Heinola.

The familiarity with metal industry companies in the region (Table 51), which varied between 7% and 71%, was less than the familiarity with industrial companies in general. Students in machinery and metal technology programs in each vocational institute and students in the Orimattila Institute electrical engineering program were most familiar with metal industry companies (46% in LAIM, 40% in HIM, 71% in OIM and 44% in OIT). Students in other technical programs, other programs in vocational institutes and general upper secondary school were quite unfamiliar with metal industry companies (13% in LAIT, 14% in HIT, 13% in HIO, 7% in OIO and 14% in HU).

Table 50. *Number of Responses of Industrial Companies in the Regions*

Region	Company	Number of Responses
Lahti	Altogether	275
	Hartwall	25
	Isku	18
	Asko	17
	Oululainen	16
	Stora Enso	16
	Upo (no more existing)	8
	Few or single	175
Heinola	Altogether	151
	Stora Enso	45
	UPM Kymmene	18
	Vierumäen teollisuus	16
	Kuusakoski	6
	Few or single	66
Orimattila	Altogether	313
	Keraplast	48
	Orfer	43
	Virke	25
	Ferroplan	24
	Ormax/Lafarge Tekkin	20
	Erteline	15
	Few or single	138
Nastola	Altogether	133
	Uponor	36
	Wipak	34
	Novart	28
	Levypyörä	11
	Raute	11
	Suominen	6
	Few or single	7

Table 51. *Familiarity With Metal Industry Companies in the Region*

Respondent Group	Knows Metal Companies %	Does not Know Metal Companies %	Empty %	Total %
LAIM	46	41	13	100
HIM	40	60	0	100
OIM	71	21	7	100
LAIT	13	77	10	100
HIT	14	76	10	100
OIT	44	44	13	100
LSTO	26	70	5	100
HIO	13	85	3	100
OIO	7	93	0	100
HU	14	82	5	100
NU	25	75	0	100
KC	22	72	5	100
OC	34	63	4	100

In Table 52 the number of times metal industry companies in the regions were named is summarized by region: Lahti (LAIM, LAIT, LSTO, KC), Heinola (HIM, HIT, HIO, HU), Orimattila (OIM, OIT, OIO, OC) and Nastola (NU).

Altogether 128 responses of metal industry companies were given by respondent groups in Lahti (260 students), 32 responses by groups in Heinola (159 students), 120 responses by groups in Orimattila (157 students) and 31 responses by a group in Nastola (64 students). The students in Orimattila showed most familiarity with metal industry companies compared to other groups. The students in Heinola named the fewest metal industry companies compared to other groups.

Table 52. *Number of Responses of Metal Companies in the Regions*

Region	Company	Number of Responses
Lahti	Altogether	128
	Teräspeikko	27
	Kemppi	8
	Rammer	6
	Starckjohann Steel	6
	Few or single	81
Heinola	Altogether	32
	Kuusakoski	5
	Harkko	4
	Myllyojan Metalli	3
	Few or single	20
Orimattila	Altogether	120
	Ferroplan	36
	Orfer	32
	Orima	9
	Nesco	9
	Few or single	34
Nastola	Altogether	31
	Levypyörä	11
	Raute	8
	Lahden Autokori	2
	Novart	2
	Single	8

Education System

Frequency Distribution

- *Joint-application system as information source* (Item 1a) was strongly important (13.07) or important (41.42) to 55% of the respondents.
- *Information about various education and training sectors and occupations from the Internet* (Item 9a) was strongly important (6.78) or important (26.66) to 33% of the respondents. 23% of the respondents found the information from Internet unimportant.
- *Knowledge about the opportunities provided by the Finnish education system* (Item 59a) was strongly important (5.89) or important (27.07) to 38% of the respondents.

- *Further training and education opportunities in polytechnics or universities* (Item 31a) were strongly important (23.89) or important (28.48) to 52% of the respondents.

Most respondents in general upper secondary education found the possibility of further education in polytechnics or universities (Item 31a) strongly important or important (80%). Approximately half (51%) of the respondents found simultaneous studies in upper secondary school and vocational institution unimportant (Item 56).

Gap Analysis Results

Item 1. The results of the gap analysis are positive (0.38 in LAIM, 0.90 in HIM, 0.31 in OIM). The results show that student have received sufficient information about educational choices in association with their joint application. The results are consistent with all but three respondent groups, where the gaps are only slightly positive (0.05 in HIT, 0.07 in OIO; 0.07 in OC).

Item 9. The results of the gap analysis are positive (0.42 in LAIM, 0.50 in HIM, 0.92 in OIM). The results show that students have received sufficient information for their educational choices from the Internet. The results are consistent with the other respondent groups, however the gaps vary quite widely from as much as 1.06 (OIT) to only 0.13 (OIO).

Item 59. The results of the gap analysis are negative (-0.19 in LAIM, -0.70 in HIM, -0.08 in OIM). The negative results show that the opportunities available to students within the Finnish Education System are not well known to them. The results from other respondent groups vary between positive values (0.50 in OIT) and negative values (-0.38 in OC).

World of Work

Frequency Distribution

- *Finding employment after studies* (Item 45a) was strongly important (25.56) or important (33.65) to 59% of the respondents.
- *Versatile and challenging occupation* (Item 63a) was strongly important (17.86) or important (39.87) to 58% of the respondents.
- *Good wages in the occupational sector* (Item 50a) was strongly important (18.63) or important (33.76) to 52% of the respondents.
- *Tidy work* (Item 64a) was strongly important (9.28) or important (27.20) to 36% of the respondents. 14% of the respondents found the tidiness of work unimportant.

Respondents in general upper secondary education found tidy work (Item 64a) strongly important or important (40%). Thirty-five percent of all respon-

dents found the trend image of an educational field unimportant (Item 65a). Nineteen percent of them found knowledge about occupational titles unimportant (Item 42a).

Gap Analysis Results

Item 45. The results of the gap analysis vary from slightly positive to slightly negative (0.26 in LAIM, -0.10 in HIM, 0.15 in OIM). The positive results show that students consider it important to have reasonable assurance of securing a workplace after completion of their studies. The results are consistent with other groups.

Item 63. The results of the gap analysis are positive (0.28 in LAIM, 0.10 in HIM, 0.31 in OIM). The results show that students consider it important for their chosen occupation to be challenging and versatile. The results are consistent with other respondent groups, except for four groups that have negative gaps (-0.14 in HIT, -0.09 in HU, -0.06 in KC, -0.21 in OC).

Item 50. The results of the gap analysis are zero, slightly positive or slightly negative (0.15 in LAIM, 0 in HIM, -0.15 in OIM). The positive gap shows that students consider it important for their future occupation to have good wages. The results are negative in the other respondent groups, except for four respondent groups (0.55 in LAIT, 0.25 in OIT, 0.25 in NU, 0.27 in HU).

The least important factors within the element *World-of-Work* are Items 42 and 65. The results of the gap analysis for *Item 42* are positive (0.58 in LAIM, 0.10 in HIM, 0.54 in OIM). This shows that students were familiar with several occupational titles when they made their educational choices. The results are consistent with other groups. The results of the gap analysis for *Item 65* are zero or positive (0.09 in LAIM, 0 in HIM, 0.08 in OIM). The positive results show that students consider the image of their educational field as a trend field. The results in the other respondent groups vary from each other. In vocational institutions the students in hotel and catering consider that their field seems to be a trend field (0.77 HIO). Respondents in general upper secondary schools and comprehensive schools also have high positive gaps (1.22 in NU, 1.41 in HU, 0.67 in KC, 0.97 in OC), which means that they too want their chosen field to have a positive modern image.

The Factors of the Second Phase of the Attractiveness Process, Remaining in Education and Training for Completion

Frequency Distribution

- *Meaningful studies* (Item 76a) was strongly important (37.64) or important (42.26) to 80% of the respondents.

- *Completion of the studies and the graduation for an occupation* (Item 66a) was strongly important (42.74) or important (35.73) to 79% of the respondents.
- *Own activity in studies* (Item 73a) was strongly important (28.39) or important (47.05) to 76% of the respondents.
- *Encouraging support from the parents* (Item 85a) was strongly important (27.48) or important (40.58) to 68% of the respondents.
- *Be a member in a group of friends/pals* (Item 69a) was strongly important (24.76) or important (44.09) to 69% of the respondents.
- *Show one's competence during studies* (Item 77a) was strongly important (23.60) or important (48.01) to 72% of the respondents.
- *On-the-job learning periods* (Item 74a) were strongly important (22.65) or important (38.92) to 62% of the respondents.
- *Information about employment prospects of the sector* (Item 80a) was strongly important (18.66) or important (36.36) to 55% of the respondents.

23% of the respondents found activities with partner companies and school/institution classes unimportant (Item 81a). Satisfaction with educational choice (Item 87b) is the weakest among students in machinery and metal technology program 29% strongly agree that they are satisfied with their educational choices and 7% strongly disagree that they have made the right choice.

Table 53. *Satisfaction with Educational Choice*

Satisfaction Students in Educational Programs	Strongly Disagree	Mildly Disagree	Not Sure	Mildly Agree	Strongly Agree	Total %
Machinery and metal technology	7	8	24	32	29	100
Other technical programs in VET	0	2	19	44	36	100
Other programs in VET	2	6	10	31	51	100
General upper secondary school	4	5	16	28	48	100
Altogether	3	5	16	32	44	100

The highest satisfaction with their educational choice was among students in other programs in vocational institutions (51%). Only 44% of the students strongly agreed that they had made the right choice. Table 53 shows these results.

Gap Analysis Results

Item 76. The results of the gap analysis are positive and negative (0.29 in LAIM, 0.20 in HIM, -0.46 in OIM). The positive results show that students consider their studies to be meaningful. The gaps of the other respondent groups are negative, varying from –0.04 to –1.01.

Item 66. The results of the gap analysis are positive (0.50 in LAIM, 0.30 in HIM, 0.54 in OIM). The results show that students intend to complete their studies. The results of other respondent groups are consistent, although they vary from 0.01 to 0.44.

Item 73. The results of the gap analysis are positive and negative (0.02 in LAIM, -0.2 in HIM, 0.23 in OIM). Negative results show that students are not satisfied with their own study activity. The results of other respondent groups are similarly negative, varying from –0.05 to –1.00.

The least important factors within the *Second Phase of the Attractiveness Process* are Items 71 and 81. The results of the gap analysis for *Item 71* are positive (0.35 in LAIM, 0.20 in HIM, 0.08 in OIM). This shows that students are satisfied with the support they received from the staff of their educational institution. The results from other groups are similar. The results of the gap analysis for *Item 81* are zero and negative (-0.02 in LAIM, -0.80 in HIM, 0 in OIM). The negative results show that the student group does not have a partner company. The results from other groups are also negative, except three (LAIT, HIT, NU, HU).

6.2.2 Summary of The Detractors from and Contributors to Attractiveness

The results from the questionnaire survey were analyzed to identify the detractors from and contributors to the attractiveness of vocational upper secondary education and training. The results from the questionnare contain the results of the gap analysis and the open-ended questions on the questionnaire. In this section the researcher presents the summary of those results along with results from the short essays and focused interviews.

Tables 54-58 present a summary of the results under each element of attractiveness. In the element *Individual* the detractors and contributors are divided into personal and intra-individual categories. The detractors and contributors under the other elements are divided into structural and interaction categories. Each factor can either contribute to or detract from attractiveness depending upon whether it is fulfilled positively or is deficient.

Table 54. *Detractors from and Contributors to Attractiveness Under the Element Individual*

Element	Detractors from Attractiveness		Contributors to Attractiveness	
	Personal	Intra-individual	Personal	Intra-individual
Individual	Gender	No special interests and reasons for choices. Diverse skills and learning orientation. Insufficient opportunities to use practical skills in education and training.		Special interests (hobby, people oriented work, good wages). Diverse skills and learning orientation. Sufficient opportunities to use theoretical understandings in education and training.

Table 54 presents the detractors from and contributors to attractiveness within the element *Individual* at the microlevel. Interest aspects have the most significant affect on the educational and career choices of young people. Some student groups report special interests, such as people-oriented work, a special hobby or good wages. Many students in the machinery and metal technology program were not able to give reasons for their choices. The results from occupational choice tests are considered quite unimportant, or they had only a minor affect on the students' educational and career choices.

Gender seems to have little overall effect on educational and career choices, but it can discourage female students from applying to traditionally male fields. Skills and learning orientation are important for the students. They want to use their practical skills and theoretical understandings in their studies. All respondent groups stated that they had not had as much opportunity to use their practical skills in their studies as they had expected.

Table 55 presents the detractors from and contributors to attractiveness within the element *Social System* at the microlevel. Young students are often not familiar with their family members (fathers', mothers' or custodians') education and occupation. Encouragement from parents is more important than the opinions of and information from the parents. Having acquaintances or relatives in an occupational field, and knowing about their experiences and their information are important for students. Peers' opinions are not important for student's when they make their educational and career choices.

Table 55. *Detractors from and Contributors to Attractiveness Under the Element Social System*

Element	Detractors from Attractiveness		Contributors to Attractiveness	
	Structural	Interaction	Structural	Interaction
Social System		No knowledge about education and occupation of family members.		Encouragement from parents. Acquaintances and relatives in an occupational field.

Table 56 presents the detractors from and contributors to attractiveness within the elements on the institutional level, *Comprehensive School, Vocational Institution and Company*. Information about educational opportunities from career counselors in comprehensive schools is important for students. Satisfaction about the quantity and quality of information they receive varies among respondent groups. Most students, however, consider the information they received to be relatively unbiased or only slightly biased. Some students found it unimportant to visit companies with teachers or career counselors. However, the lessons given by the representatives from various occupations are important for them.

Professionally skilled teachers are important for the students. The results of the gap analysis are positive. A well-structured educational program is important for students and also that the program have a good reputation. Students also appreciate there being a good climate among the students and the whole staff of the institution/school.

Table 56. *Detractors from and Contributors to Attractiveness Under the Elements on Institutional level*

Element	Detractors from Attractiveness		Contributors to Attractiveness	
	Structural	Interaction	Structural	Interaction
Comprehensive School		Insufficient information about educational opportunities.	Lessons given by representatives of various occupations.	Information about education fields from career counselors.
Vocational Institution	The school is a long way from the student's home or residence.		Well-structured educational program. Esteem of given education and training. Safe environment in schools/ institutions.	Professionally skilled teachers. Good climate.
Company	No experiences from summer jobs.	Negative attitudes of companies towards young people. No interest in companies and occupations. No knowledge of industrial companies. No knowledge of special industrial companies.		Positive attitudes of companies towards young people.

The infrastructure of the institution/school is not as important as the school's staff and the content of the educational program. A safe environment is important for students. The proximity of the institution/school is also important, students do not want to have the school a long way from their home or residence.

Students are generally not familiar with industrial companies. Students attending technical programs and general upper secondary schools in more rural areas or small centers (Orimattila, Nastola) are more familiar than those in larger

cities (Lahti, Heinola). Students in technical programs are more familiar with the metal industry in their region than students in other programs. Approximately 20% of students are not interested in knowing companies or occupations in companies. One-third of them are not interested in information about companies in local newspapers and half of them find information about companies in local radio to be unimportant. Most students have not gained experience from summer jobs with companies. The attitudes of companies towards young people varies, some results being positive and some negative.

Table 57. *Detractors from and Contributors to Attractiveness Under the Elements on Macrolevel*

Element	Detractors from Attractiveness		Contributors to Attractiveness	
	Structural	Interaction	Structural	Interaction
Education System	.	No knowledge about opportunities in the Finnish education system.	Joint application system. Internet as an information source.	
World- of-Work	The content of the work is not versatile and challenging.		Versatile and challenging work. Employment possibilities in the future. Good wages in the occupational sector.	

Table 57 presents the detractors from and contributors to attractiveness under the macrolevel elements, *Education System* and *World-of-Work*. Students find knowledge about educational opportunities in the Finnish education system important, but the negative gap results show that the possibilities are not well known. The joint application system provides good information to students about educational opportunities. They reported receiving sufficient information from the joint application system. The Internet is important as an information source for one-third of students. Some students, however, found information from the Internet to be unimportant.

Training for a versatile and challenging career is one the most important reasons given by students for their educational and career choices. The assurance of securing a workplace after completion of their studies and good wages in the sector are important for some students, especially in technical programs.

Table 58 presents the detractors from and contributors to attractiveness under the second phase of the attractiveness process. The meaningfulness of the studies is important, but the results of gap analysis are negative for most respondent

groups. On-the-job learning periods are important for students, but they consider that these experiences have not been a beneficial for them as they expected. Students consider it important to be able to show their competence in education and training, but the gap results are negative, which shows that they do not believe they have had sufficient opportunity to do so.

Table 58. *Detractors from and Contributors to Attractiveness Under the Second Phase of the Attractiveness Process*

Element	Detractors from		Contributors to	
	Structural	Interaction	Structural	Interaction
Second Phase	Not meaningful studies. On-the-job learning periods do not meet expectations.	No opportunity to show one's competence in education and training. Not enough self-study activity Not enough information about employment opportunities.	Completion of education and training.	Encouraging support from parents. Having friends in the program.

Encouraging support from the parents is important for students, and every student group reported that they were encouraged by their parents. Having some friends in the program, and the safety that this is perceived to bring, is more important than the opinions of peers. Self-study activity is important, but the results of gap analysis are negative in most respondent groups. Completion of education and training is important for students.

Information about employment possibilities is important for students, but most of the respondent groups reported not receiving sufficient information at the beginning of their studies.

6.3 Construction of the Model of Attractiveness

Model of Attractiveness

The construction phase in a constructive case study involves development of a model based on the data collected in order to provide a explanation of the observed dynamics of the phenomenon in question, which not only helps to understand the particular phenomenon but may also contribute more broadly to theoretical understandings of the issue (Lukka 2000).

The results of the questionnaire survey indicated that a fundamental source of the educational and career choice and attractiveness of an educational field is the content of the work; which must be diverse and challenging in order to attract students. Some respondent groups were even more specific in stating that they were attracted to work that was people oriented work and related to their personal hobbies and interests. The researcher concludes that the content of the work can be made more diverse and challenging only by changing the reality of working life, specifically by introducing the desired characteristics to working methods, conditions and organizations.

The results also indicate that students expect that there will be a good climate amongst teachers and students at educational institutions and that teachers will be professionally skilled, which again involves the development of working methods, conditions and organizations in educational institutions and teacher education.

On the basis of these results and conclusions the researcher has constructed a model of attractiveness, which is shown in Figure 26. The model shows that *the attractiveness of an educational field results from three sequential action phases. The first phase is the phase of educational and career choice, the second phase is the process of education and training, and the third phase is the transition from school to occupation. Each phase is affected by elements of attractiveness, which are general categories that contain factors that contribute to or detract from the overall attractiveness of an educational field and career. There are three interdependent aspects to the model. The developmental path from workplace to educational institution describes the introduction of the desired characteristics of challenging and versatile work to working methods, conditions and organizations for personnel in workplaces and educational institutions; the interaction dimension describes the various modes of interaction that contribute the collective development; and the overall satisfaction with education and career, which can be achieved only by actualizing the first two aspects.*

Therefore, the model of attractiveness of an educational field is not only a model for attracting students into education, it is also a model for satisfaction with education and career, which can be achieved only through the development of working life and educational institutions. Enhancing attractiveness as described by the model would meet not only the needs of individual students, but also the needs of those in the world-of-work.

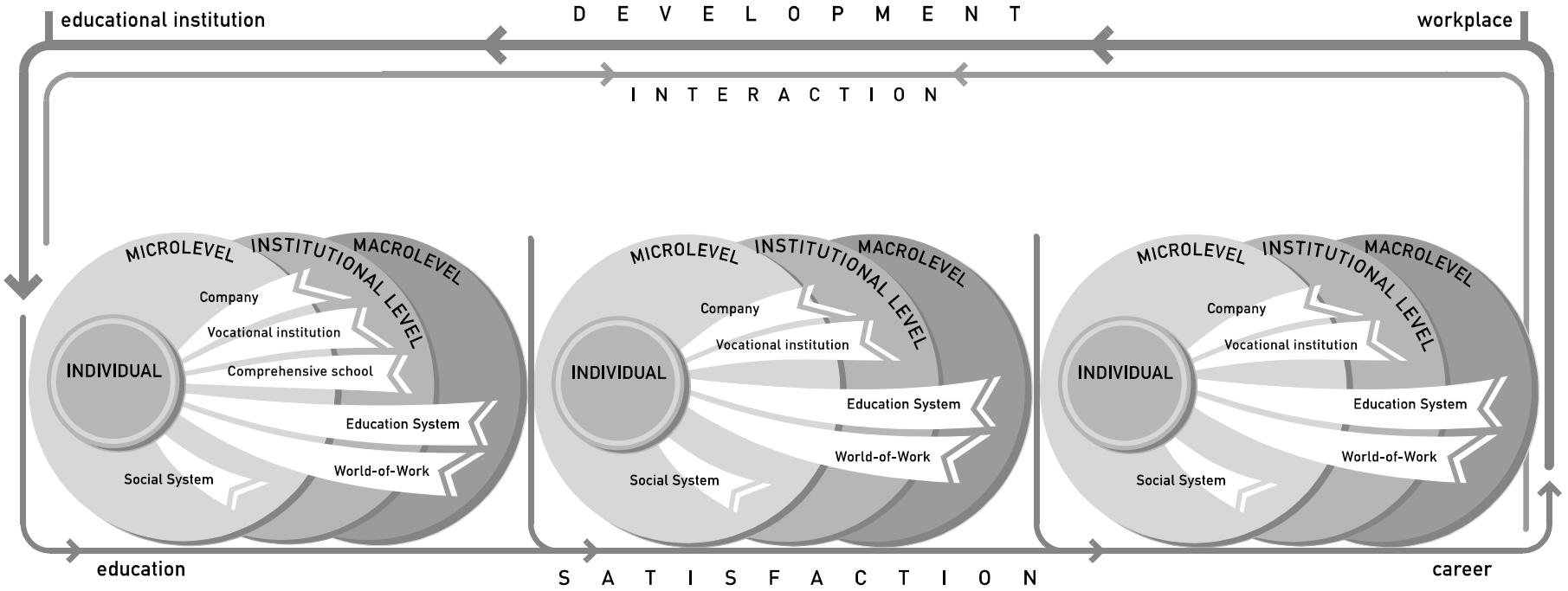

Figure 26. *Model of Attractiveness of Vocational Upper Secondary Education and Training*

Concept of Attractiveness

At the outset of this research the same characteristics of the definition of attractiveness was used as had been developed for the study of the attractiveness of regions. *The attractiveness of an educational field is defined as the standing of the field in the field of choices of the education seekers. The field of choices consists of the possibilities that the education seekers get to know and which they prefer as their potential study places.* (adapting Raunio 2002a, 15.)

This definition contained the focal components of attractiveness: the education seeker, the opportunities and knowledge of opportunities and the preferences of the education seeker. After the first data collection and analysis phase the researcher found that attractiveness cannot be considered only in terms of the entry phase to education, but must be seen as a process extending from entry to an educational program through the beginning of a career in the world-of-work. Thus, the first definition appeared too limited in both process and content terms. Although knowledge of educational opportunities is important, it is not the only factor that contributes to the attractiveness of a certain educational program and career path.

The final model in Figure 26 represents the dynamic process of attractiveness with various phases, observation levels, elements as well as structural and interaction detractors and contributors.

The concept of attractiveness can, therefore, be better defined as follows: *the attractiveness of education and career is the inter-play of contributors to and detractors from the individual career choice and development process, which guide the individual towards satisfaction with educational and career pathways.*

7 EVALUATION OF THE QUALITY OF THE RESEARCH

In this section the process for verification of the quality of the research is discussed. The basis for this assessment is the classification of quality issues by Miles and Huberman (1994, 277-280), which is presented in Table 23 in Chapter 4 and the evaluation criteria by Punch (1998), which considers the quality of mixed method research. The evaluative criteria of the research have been considered throughout the entire research process. Evaluative criteria were considered in each of the five main parts of the research process: the 'set-up' of the research, the empirical procedures used in the research (design, data collection, sample and data analysis), the quality of data, the results and conclusions reached in the research and the presentation of the research (Ibid. 253–263). At the end of the section the researcher discusses the ethical issues of the research.

The 'Set-Up' of the Research

The evaluative criteria for the ´set-up' of the research consider the topic, purpose, and theoretical foundations of the research, the quality of research questions, the context of the research and the objectivity of the research (Punch 1998, 253).

This research aims at understanding the phenomenon of attractiveness of vocational upper secondary education and training. The objective of the research was to construct a model of attractiveness for the practical use of policy makers and stakeholders in educational institutions and companies. The scientific value of the model lies in its examination of career development in a holistic way that has not been done before. The results of the research bring new knowledge and understanding to the current trend of convergence of career development theories.

The research population, context and the topic are presented in detail in Chapter 2, which describes the state of vocational upper secondary education and the workforce for the machinery and metal technology sector in the Lahti Region. The relevance of the research is in the practical concern of ensuring a sufficient supply of skilled labor for metal industry companies, which is also a concern in other private and public sectors in Finland and other EU Member States.

The theoretical foundation for the research lies in career development theories and interest theories. The connection to earlier research literature is made primarily in terms of Finnish research because the phenomenon of career development and educational choices is affected by cross-national differences (Kirkpatrick Johnson & Mortimer 2002). Earlier research has investigated the phenomena from a socio-

economic perspective or the individual career orientation perspective. This research approaches the phenomena more holistically and from the 'pulling' point of view, and thus aims at completing theoretical and practical understanding of the attractiveness of various educational programs and their associated careers.

The research design is related to the research questions, as well as to the researchers' philosophical stance: ontology, epistemology and human nature all affected the choice of the research methods. These are discussed in Chapter 4. The following discussion of the research questions is based on the criteria of appropriate research questions, which are proposed by Punch (1998). The main research question and sub-questions in this dissertation are:

The main research question and sub-questions in this dissertation are:

> Main Research Question: What model would represent the relationship between and inter-play of the elements and factors of attractiveness in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology?
>
> Sub-Question #1: What are the elements and factors of attractiveness to students of vocational upper secondary education and training in machinery and metal technology?
>
> Sub-Question #2: What factors are most important in contributing to or detracting from the attractiveness to students of vocational upper secondary education and training in machinery and metal technology?

According to Punch (1998, 254) effective research questions are clear, specific, answerable, interconnected and substantively relevant. The research questions in this research can be easily understood and they are unambiguous. The topic of the research is substantively relevant because the lack of attractiveness of vocational upper secondary education and training for this sector is the focus of development in several local and national development plans.

The concepts in the research questions have been considered with special care because the research concerns a problem that has not been investigated previously. The research questions are interconnected and are the basis for the research process, in which the data and results from the previous phase are required to be able to answer the research question of the subsequent research phase. The unambiguous research questions are the foundation for research design and thus ensure the *reliability* of the research (Miles & Huberman 1994).

The concepts in this research match the empirical world of career choice and development (Blumer 1969, 28). However, the problems and limitations in translating concepts from Finnish into English and from English into Finnish have received special attention from the researcher. The aim has been to translate the meanings, not the words. Examination of the text by a professional language consultant was unavoidable.

The required data could have been collected using various methods. The researcher chose the case study approach as a methodological umbrella. This approach uses constructive research methodology that produces constructions (Ka-

sanen et al. 1993). In a case study, the data collection can involve questionnaires, interviews, observation and/or use of archive materials, and the data can be qualitative or quantitative (Järvinen & Järvinen 2000, 78). Different research questions require different research methods (Punch 1998, 244). Furthermore, the researcher decided to use multiple triangulation to implement the research, employing both methodological triangulation (between-method triangulation) and data triangulation (Denzin 1978). In this research, triangulation has two purposes: to ensure the reliability of the research and to obtain a deeper understanding of the phenomenon. The methodological choices are discussed in detail in Chapter 4.

The researcher uses both qualitative and quantitative methods, which were selected according to the research questions. Punch (1998, 240) argues that the choice of qualitative and quantitative research methods "should depend more on the purposes and circumstances of the research than on philosophical considerations." The researcher assumed that in this research she could not discover everything she wanted to know by using only one approach. The research process was not tightly structured in advance, the data collection methods for the second phase of the research were only finally decided during the research process as a result of data collection and analysis from the first research phase.

The role of the researcher in qualitative research has been the subject of extensive discussion and debate. The subjectivity of the researcher is claimed to affect the research process through its affect on both data collection and analysis. Thus, the researcher's own experiences affect the results and conclusions of the research. Vertanen (2002, 240) points out that discussion of the subjectivity-objectivity of the researcher should also consider the role of quantitative researchers by including a discussion of methodological choices and their consequences.

Malterud (2001) points out that *reflexivity* in research starts by identifying the researcher's preconceptions, including previous personal and professional experiences, motivation and qualifications for exploration of the field. These are explained in the following paragraph. The autobiographical statement (2.1.2) provides background information of the researcher's interests in, contributions to and experience of the research topic so that her personal perspective and intentions on the research can be understood.

The researcher became interested in the research topic when she worked with metal industry and other industrial companies in the Lahti Region for six years, from 1998 to 2003. She has worked with companies in human resources development projects conducted by the Lahti Region Educational Consortium. She has also led teacher education projects to promote cooperation with the world-of-work. The researcher encountered discussions of the decreasing attractiveness of the machinery and metal technology field both in companies and educational institutes. She became interested in the debate and was able to consider the problem from a distance, not as a key stakeholder of the problem. Thus, the researcher was familiar with the research area and was in close and continuous contact with the various stakeholders. Blumer (1969, 38) points out that the "empirical social world consists of ongoing group life and one has to get close to this life to know what is going on in it." Fortunately, the researcher had the benefit of close relationships and the op-

portunity for direct discussions with various stakeholders throughout the entire research process.

The researcher places herself in the middle of the field on the institutional level, where she has close relationships to both companies and educational institutes and their personnel. The researcher is aware of biasing factors that might affect the neutrality and *objectivity* of the research. The researcher has attempted to report the process for data collection and analysis and the conclusions of the research in such a way that the objectivity of the research can be confirmed (Miles & Huberman 1994). This audit trail begins with the presentation of the preconceptions of the researcher in Figure 19. Throughout the process the researcher has examined her own preconceptions and tried to identify their absence and presence during the data collection, data analysis and conclusion phases. Malterud (2001) points out that in every phase of a qualitative research the effect of the researcher should be assessed and shared, the bias cannot be eliminated but it can be reported and considered.

The Empirical Procedures Used in the Research

The empirical procedures in the research include the design of the research and data collection as well as data analysis tools and techniques (Punch 1998). The interconnection between the research questions and data collection ensure the *reliability* of the research (Miles & Huberman 1994). The choices of data collection instruments and data analysis techniques of this research are described in detail in Chapter 4, Research Methodology, and Chapter 5, Implication of the Research. In these chapters the reader can follow the choices of empirical procedures made by the researcher.

The samples and criteria for selection in qualitative as well as quantitative parts of the research are described in detail in Chapter 5. The researcher conducted the first data collection with short essays by first year students in a machinery and metal technology program (n=80). The objective of this phase was to obtain in their own words the factors that influenced students' educational choices. The data deepened the researcher's understanding of the phenomenon and caused her to make changes to her preconceptions.

The researcher conducted the second data collection with focused interviews of representatives from educational institutions and companies as well as students in vocational institutions (n=13). The interviewees chosen were those with the best knowledge of the phenomenon: first year students in a machinery and metal technology education program, career counselors in comprehensive schools and vocational upper secondary institutions, education managers and head masters of technical education programs, human resources managers and metal workers in the metal industry. The interviews were designed to identify the elements and factors of attractiveness of vocational upper secondary education and training in machinery and metal technology. The researcher did not interview students in comprehensive schools, which might have revealed additional perspectives of the phenomenon. However, the research design did include a questionnaire survey in which students

in comprehensive schools were one respondent group. The interviewees and interview sessions are presented in Appendix 1.

The researcher considered the problem of the possible lack of *validity of the interviews* beforehand by taking notice of the following issues: the attitudes and opinions of the interviewer, a tendency for the interviewer to seek answers that support her own preconceptions, misperception of the interviewees meanings and misunderstanding the interviewer's questions and meanings (Cohen & Manion 1994, 282). Bias in the interviews was reduced by carefully formulating the questions and arranging undisturbed interviews sessions. One of the interview transcripts was taken back to the interviewee before analysis. The interviewee made no corrections to the transcript.

The third data collection was accomplished with standardized questionnaires, which were developed for this research. With an extensive questionnaire study it was easier and more systematic to make comparisons of the respondent groups in various educational programs and institutions. The risk of 'researcher imposed constructs' was reduced by the three-stage design. The respondent groups' constructs were elicited with short essays and interviews and the questionnaire form was designed using these constructs. (Punch 1998.) The sample size was extensive—the questionnaire was presented to 736 students. The return rate was 640 (87%), which is good and validate the quality of data. The sample for this research was constructed using stratified sampling with optimal allocation (Heikkilä 1998, 37).

The design of the questionnaire form was both successful and unsuccessful. The questionnaire data did provide answers to the research questions. The gap analysis and open-ended questions, as well as the background questions produced data that was useful in answering the research questions and the data could also be compared effectively. The disadvantage of the questionnaire design was that it also produced data that was left unused in this research and data that had no value. The use of data analysis instruments is transparent. These are discussed in detail in Chapter 5. In Chapter 6 and associated appendices the results of data collection and analysis are displayed. Also, the conclusions from the data and results are reported carefully in Chapter 8. Thus, the reader is able to follow the full sequence of research phases, which creates an audit trail through the research (Miles & Huberman 1994; Punch 1998).

Each data collection was systematic and thorough. The data was carefully retained both in its original form on paper (short essays, questionnaires) and original interviews on digital MD. The transcribed data from interviews and questionnaire database are also stored carefully on CD-ROMs. This allows reanalysis by other researchers if necessary. The data analysis procedures are transparent and the reader is able to follow the research from data analysis to results and conclusions. The appendices present the "raw material": quotations of the interviews, quantitative data analysis, frequency distribution and gap analysis results. Thus, the *repeatability* of the research is made possible.

However, Blumer (1969, 34) asserts that empirical validation of the research does not lie in the manipulation of the methods; it lies in the examination of the empirical social world. The aim is to return the results to the social world. In the

present study, the researcher returns the results to the real world in the discussion of results section and also in the recommendations to practitioners and researchers.

The Quality of Data

Punch (1998, 257) points out that "the results and conclusions of empirical research are only as good as the data on which they are based." In this research the procedures of data collection were planned in the research design. However, the researcher reconsidered the data collection and analysis methods after each data collection and data analysis phase, and the process for the subsequent data collection phase was only finally determined during the course of the research. Multiple data sources were used in this research, and *triangulation* was used to provide *reliability* to the research.

The researcher designed the data collection instruments. The questions for the focused interviews were planned in response to the analysis of the short essays by students and preliminary discussions with various stakeholders. The focused interviews were designed to answer the first sub-question of the research. The questionnaire form was based on the analysis of the focused interviews. Also the results from the previous research phases were used. The gap analysis technique and structure for the questionnaire form was selected in consideration of Raunio's (2002a) investigation of regional attractiveness. The questionnaire form was pilot tested with a group (n=7) of machinery and metal technology students at a vocational institute.

Data analysis procedures were selected to best match the collected data, research question and research method. The data categories used in the content analysis of short essays, focused interviews and open-ended questions in questionnaires was driven by the data itself rather than being predetermined. Quantitative data analysis was used to find the frequencies of various responses and gap analysis was used to identify contributors to and detractors from attractiveness.

According to Punch (1998), the *validity of the data* refers to how well the data represents the phenomena for which they stand? In the technical sense this means the data can be validated through the use of check-coding and by following the audit trail through the analysis. Figure 21 illustrates process used for analysis of qualitative data. The researcher verified each phase of the analysis before she proceeded to the following phase.

Reactivity concerns the extent to which the process of collecting the data changes the data. "Has the research process itself, and specially the collection of data, somehow influenced the data, or even created data" (Ibid. 258). The collection of data through interviews was the most critical phase of data collection in this research. The interviewer always has an influence during interviews. The researcher carefully considered what was said during interviews and in those cases where they did not seem to be providing any new information they were truncated. The nature of the questionnaire forms can also limit or generate data, although the researcher planned the questionnaire form according to the data analysis of the interviews so as to minimize this effect. The open-ended questions on the question-

naires were used to permit respondents to comment in their own words without the constraints of predetermined questions.

The quantitative data on questionnaires was analyzed using frequency analysis and gap analysis. The open-ended questions were analyzed using content analysis, in which the categories were derived from the data. The responses were not forced into the main categories, and thus the frequency distributions of the open-ended responses contain the category 'other.' All responses were considered and categorized. The researcher verified each phase of the analysis before she proceeded to the following phase.

In the analysis of interviews and open-ended questions on the questionnaires, the researcher's interpretation of the meanings of the persons involved is crucial (Shank 2002). The researcher had no intention of making the meanings and realities of the respondents suit her own purposes.

The Results and Conclusions Reached in the Research

The objective of the research is to answer the research questions. The results are the data that is generated concerning the questions and the conclusions are what can be said about the questions on the basis of these results. (Punch 1998.)

In qualitative research, *internal validity* is determined by the extent to which the results faithfully represent and reflect the reality, which has been studied. (Ibid.) In this research internal validity is ensured by careful attention to the internal logic and consistency of the research, so that each part of the research fits together, each phase follows another and each is reported thoroughly and transparently.

External validity is the question of *generalizability* or *transferability*. How far can the results of this research be generalized and are the conclusions transferable to other settings? (Punch 1998, 260.) In a case study the comprehension of the phenomenon is considered to be more important than the generalizability of the results (Syrjälä & Numminen 1988, 175). The results and conclusions of this research are specific to the specific research context. However, the product of this research—the model of attractiveness of vocational upper secondary education and training—can be applied in other contexts, especially with respect to observation levels and the elements of attractiveness. The lower level factors that contribute to and detract from attractiveness are more context dependent and change over time and among respondent groups.

In Chapter 8 the researcher makes recommendations for practitioners to take action and for researchers to use the research results in further research.

The Utilization of the Research

In constructive research it is necessary to ask: Does the constructed model actually help to solve the local problem? The quality of constructive research can be assessed by using the criteria developed by Kasanen and al. (1993), who point out that the features of a successful constructive research are: an innovative solution to

a real life problem, the potential for the solution to be used more generally and the demonstrated usability and theoretical connections of the construction.

The product of this research is the model of attractiveness. This construction is based on the pre-existent theoretical framework for the phenomenon and the results of the research data. Salmi and Järvenpää (2000) point out that the construction cannot exist as a separate, single model. The construction and the use of a model require a consistent base of former theories, observation and comprehension.

Use of the knowledge from constructive research can vary from consciousness raising and self-consciousness to development of a theory or model for guiding action and policy makers, or it may suggest corrective recommendations (Miles & Huberman 1994). The researcher considers these results to be useful in variety of ways.

The theoretical framework of the research can be used to give a more holistic view of the phenomena of attractiveness of vocational upper secondary education and training. Thus, the theoretical part is conscious raising. Undoubtedly the specific results of the research will raise the consciousness of practitioners and researchers.

The pragmatic value of the research lies in the constructed model. It can be used for guiding action and also for policy making. It will only be possible to finally judge the pragmatic value after the conclusions and recommendations of the research have been put into practice. The conclusions of the research will be presented to policy makers and stakeholders in educational institutions and companies, locally and nationally. In Chapter 8 the researcher makes recommendations for researchers and practitioners based on the conclusions, results and experiences during the research process. The recommendations for practitioners as well as the essential results of the research will be published in Finnish for stakeholders in companies and educational institutions.

Ethical Issues of the Research

Shank (2002, 97) points out that "a good researcher is an ethical researcher." He suggests four notions to be considered in qualitative research. These are: be honest, be careful, do no harm and be open. The researcher considers these notions below.

First, the sincere intention of the researcher is to be honest with others and with herself. Second, the research is reported and documented carefully, and a clear audit trail can be followed throughout the whole research. All raw data, intermediate stages and working records are stored on paper and in most cases also on CD-ROMs.

Third, the researcher discussed the research topic during the design phase with various stakeholders and agreed with them about the need for the research. The research was not intended to bring up painful issues for the stakeholders but to address issues of importance to them in helpful ways. In the application of the questionnaire survey a head master examined the questionnaire form beforehand to make sure the questions would not harm the students, teachers or other staff in the schools.

Fourth, the researcher presented the research process and results of the research to stakeholders on various occasions. These included steering groups for projects concerning students who drop-out of vocational institutions, forecasting of qualitative and quantitative training needs, and the employment and training of long-term unemployed persons. The researcher presented the research to other researchers in research seminars on five occasions. Thus, the process and methods were open and gained *face validity*.

8 SUMMARY, DISCUSSION AND RECOMMENDATIONS

8.1 Summary of the Research

The purpose of this research was to create new knowledge and understanding concerning the attractiveness of vocational upper secondary education and training in machinery and metal technology. The research focused on the contextual and individual factors influencing the educational and career choices of young students. The main research question was: What model would represent the relationship between and inter-play of the elements and factors of attractiveness in ways that might help to find ways to improve the attractiveness to students in the Lahti Region of vocational upper secondary education and training in machinery and metal technology?

The lack of attractiveness of vocational upper secondary education and training is an important developmental concern for local, regional and national stakeholders in Finland (Opetusministeriö 2004a; Sovala et al. 2004; Työministeriö 2003a). Although this phenomenon has been previously recognized, it has not been examined in as much detail as in the current research.

The theoretical framework for this research constitutes of three focal theories of career choice and development that place an emphasis on both individual and contextual factors and influences. These theories are the Systems Theory of Career Development by Patton and McMahon (1999), the Social Cognitive Career Theory by Lent, Brown and Hackett (1994) and Krumboltz's Social Learning Theory of Career Development (1979). Theories of interest and interest development have also been used (Krapp 2002b; Lent et al. 1994).

The key concepts in the research are the attractiveness of vocational upper secondary education and training, career development and interest. The researcher has defined attractiveness as follows: *the attractiveness of education and career is the inter-play of structural and interaction factors in the individual career choice and development process, which contribute to or detractors from the individual towards satisfaction with educational and career pathways.*

The research context was the Lahti Region and the data collection strategy was a constructive case study. The research was based on multiple triangulation, and both qualitative and quantitative research methodology were used. The fundamental methodology, however, was qualitative. Research data was collected from various local stakeholder groups in comprehensive schools, vocational institutions and companies. The empirical data for this study was derived from short essays by stu-

dents in machinery and metal technology education programs (n=80), focused interviews with students, career counselors, teachers, head masters, educational managers and representatives from the metal industry (n=13). An extensive questionnaire survey with fixed responses and open-ended questions was directed to students in vocational institutions, comprehensive schools and general upper secondary schools (n=640). The response rate was 87%.

A model of the attractiveness of vocational upper secondary education and training in machinery is the main product of this research. The model is described in the following section. However, the research also uncovered other interesting results. First, the attractiveness of an educational field cannot be considered only in terms of a student's initial entry into an education program. It is rather a continuing process in which several individual and contextual factors contribute to and detract factors the attractiveness of the pathway from entry into an educational program through the transition from school to work. Next, the detracting and contributing factors were categorized into structural and interaction types. The results show that students are affected by interaction factors more than structural factors. For instance, professionally skilled teachers and a good climate at school were more important than the infrastructure and educational equipment of the schools. Many students were not familiar with their parents' education and occupation. There can be many reasons for this. One may be that the family members do not discuss their educational and occupational pathways, or the occupations and careers may be so abstract that it is difficult to get a picture of them. Finally, industrial companies in the regions were not familiar to the students although one-third of them found knowledge about the companies unimportant.

As previously mentioned, the essential product of the research is a model of the attractiveness of vocational upper secondary education and training in metalwork and machinery, Figure 26. The model shows that *the attractiveness of an educational field results from three sequential action phases. The first phase is the phase of educational and career choice, the second phase is the process of education and training, and the third phase is the transition from school to occupation. Each phase is affected by elements of attractiveness, which are general categories that contain factors that contribute to or detract from the overall attractiveness of an educational field and career. There are three interdependent aspects to the model. The developmental path from workplace to educational institution describes the introduction of the desired characteristics of challenging and versatile work to working methods, conditions and organizations for personnel in workplaces and educational institutions; the interaction dimension describes the various modes of interaction that contribute the collective development; and the overall satisfaction with education and career, which can be achieved only by actualizing the first two aspects.*

Therefore, the model of attractiveness of an educational field in vocational upper secondary education and training is not only a model for attracting students into education, it is also a basic model for satisfaction with education and career. Enhancing attractiveness, as described by the model, would meet not only the needs of individual students, but also the needs of those in the world-of-work. The students in this research were not totally happy with their educational and career

choices. Only 44% of the students strongly agreed that they had made the right choice, the range was from 29% to 51%.

The entire model is constructed of several components, which have been investigated earlier as individual components or component groups in research related to educational and career choices and educational selection. In Finland the focus of earlier research has been on contextual approaches, which have emphasized socio-economic and socio- cultural issues (Ahola & Nurmi 1995; Isoaho et al. 1990; Kivinen 1988; Kivinen et al. 1989; Kivinen & Rinne 1995). Individual approach issues have had their focus on gender, age and school achievements (Pirttiniemi 2000), measurement of individual vocational interests (Muurinen 2004) and the career orientation of students (Jalkanen 1988, Järlström 2002; Korhonen & Mäkinen 1995; Lehtonen 1999; Tiilikainen 2000; Vuorinen & Valkonen 2003). Research into educational and career choices has not focused on the issue of interest, which is a central factor in creating attractiveness of and satisfaction with educational programs and careers. The issue of interest has even been omitted entirely in some research (Ahola & Nurmi 1995; Luopajärvi 1995).

Consideration of prior research caused the researcher to examine the elements at three levels of observation: the macrolevel, the institutional level and the microlevel (Koch & Reuling 1998; Patton & McMahon 1999; Zinn 2002). The first sub-question of this research aimed at finding elements and factors of attractiveness to students and the second sub-question aimed to define what factors are most important in contributing to or detracting from the attractiveness to students of vocational upper secondary education and training in machinery and metal technology.

The elements of attractiveness that were identified in this research were: *Individual, Social System, Comprehensive School, Vocational Institution, Company, Education System and the World-of-Work*. These all exist in the Systems Theory of Career Development (Patton & McMahon 1999). However, the elements in the systems theory framework exist on different observational levels and elements with different significance are located on the same system levels. Lasonen and Manning (1999) consider the levels of analysis of the standing of vocational versus general education to be at the course/curriculum level, education system level, and labor market level. Again the issues of analysis levels are with different value and the factors or influences have not been discussed with sufficient attention to sub-levels and sub-categories. The researcher considers the elements on the observational levels in the constructed model to be more equivalent with their power and influence.

The model is divided into constituent clusters, three phases of the attractiveness process, three observation levels, seven elements and several structural and interaction detractors from and contributors to attractiveness. These provide a construct for further scientific research and development work for researchers and practitioners. The constructed model can also be developed further as an assessment tool for practitioners by developing the structural and interaction factors in each element (Tables 54-58) into question series (Ståhle et al. 2004). The questions could also serve as the basis for discussion of developmental work by stakeholders.

Theories of career development are changing as they seek theory convergence or integration (Chen 2003; Lent et al. 1994; Patton & McMahon 1999). The model

of attractiveness of vocational upper secondary education and training brings new perspectives to this process of theory convergence and integration. The current model emphasizes the comprehensive process of life-long career development, in which education and career are a congruent whole.

8.2 Discussion of the Results

In the following section the results of the research and the relationship of the current research to prior research are discussed at the microlevel, institutional level and macrolevel.

Microlevel Elements and Factors

The *Individual* is the central stakeholder in the research and practice of educational and career choice. However, the individual perspective is often omitted in discussions of the status and attractiveness of vocational upper secondary education. Research has focused primarily on macrolevel factors and some institutional level factors (Lasonen and Manning 1999).

The results of this research differ from the results by Koch and Reuling (1998), who assert that the appeal of vocational education and training depends largely on perceived subsequent earnings and career opportunities. Rather, the results of this research are consistent with that by Morgan et al. (2001), who found four types of reasons for career choices: interesting work, people oriented work, extrinsic rewards and perceived competitions. The results of the current research are also consistent with the conclusions reached by Lehtonen (1999) and Jalkanen (1988), in that the most important aspect in educational and career choice is the inherent interest of the occupation and work.

The interest of an individual in education and career is a focal factor in the attractiveness process. A student interviewee in machinery and metal technology program states it as follows: *"Metal has no attractiveness in itself, if one is not interested in it."* The results show that the nature of the work directs choices of education and career. The consecutive process of interest development seems to be most active in the upper level in comprehensive school, often in the 9th grade during the joint-application phase. To satisfy the needs of both students and stakeholders, the attention of the student has to be caught and held during the whole process of education and training (Krapp 2002b; Lewalter et al. 2001).

Sixty-five percent of the students wanted to use their practical skills in their education and training, and were not satisfied with their study activities. However, interests are encouraged by activities that enhance personal efficacy (Bandura 2000). Unlike Savolainen (2001), the results do not show that students who applied to vocational upper secondary education were not interested in studying.

The results show that gender seems to have little net effect on educational and career choices, but it can discourage female students from applying to traditionally

male fields (Stenström 1995). Altogether 112 male students and 51 female students stated they could study machinery and metal technology in vocational institution.

The *Social System* element includes both structural factors and interaction factors, such as encouragement, opinions and information from stakeholders. The interaction factors appeared to be the most significant contributors to the attractiveness of an educational program or study place. For instance, encouragement from parents and the experiences of relatives and acquaintances were considered important by students when making their choices. Neither of these factors has been sufficiently researched previously. The results of the current research are consistent with Ruohotie's (1996) model of professional growth in that the explorative learning cycle can be reinforced by external feedback and encouraging support.

Recently the relational context in career development (Blustein 2004; Phillips et al. 2001; Whiston & Keller 2004) and relationship-based learning (Ruohotie 1999) has received increased attention from researchers. The results indicate that the relational context and relationship learning seems to include family members, relatives and peers as well as acquaintances. However, many students are not familiar with their parents' education or occupation. This suggests that more research is required to understand the effect of the social system on educational choices. In several previous studies the social system has been considered only as the socio-economic background of the student, which is treated as a structural factor in this research.

Information from and opinions of peers were reported to be less important in the entry phase to education than their support during education. Other research results vary on this point. Peers and career counselors were found to be a common information source in the research by Saarela (2002), while internet and radio were found to be important information sources in the research by Taloudellinen tiedotustoimisto (2003).

Institutional Level Elements and Factors

Comprehensive schools and the working methods of career counselors at schools are often mentioned in discussion of the status of vocational upper secondary education and training compared to general upper secondary education and training (Numminen 2003; Numminen and al. 2002). In this research the working methods and information received from career counselors were not emphasized, although students have indicated that receiving sufficient and unbiased information from career counselors is important (Korhonen (1997). During the interviews, career counselors mentioned various information delivery systems several times. This shows that career counselors may consider their work to be largely that of information sources and deliverers, which is understandable because the amount of information about education opportunities and occupations is enormous and both the education system and the world-of-work are continually changing. Visits to companies are one way to become familiar with the world-of-work. However, many students prefer lessons given by representatives of various occupations to visiting companies. Thus, what is the meaning of information for students and for career counselors?

The structural detractor from attractiveness of *Vocational Institutions* is that the school is often a long way from the student's home or residence. Some students wanted to have their study places close to home so that they can walk to school. A structural contributor to attractiveness is the safe environment of the schools (Comerford 1981).

The status of education and training is not as high as students expected and the educational programs are not as well-structured as they would wish them to be. Professionally skilled teachers and a good climate at schools is important for students (Luopajärvi 1995). These are reported by students in general upper secondary schools and comprehensive schools to be the most significant attractions of study places.

The readiness of students to study in machinery and metal technology programs varied between 19% and 63%. The most frequently stated reason for not studying machinery and metal technology was that the education program *'is not interesting/does not suit me/is not my thing'* or a reason the students could not state. Some students in other technical programs in vocational education stated that the work in the machinery and metal technology sector is boring. The students gave their reason for choosing a program as *'if I were interested'* or could not state their reasons. Again, the interest of the student seems to be the primary factor in determining their choice of an educational program (Krapp 2002b; Lent et al. 1994).

Readiness to study machinery and metal technology in vocational upper secondary education and training varied between 19% and 63%. Altogether 112 male students and 51 female students stated they could study machinery and metal technology in vocational institution. The statistics show that ten students (7.4%) from Orimattila comprehensive school (OC) and two students (1.9%) from Kannas comprehensive school (KC) applied to a machinery and metal technology program during the joint application process in 2004 (Metalliteollisuuden keskusliitto/Opetushallitus 2003). A few months later the questionnaire survey of this research was conducted. In the results 31% of the students at Orimattila and 24% Kannas at indicated a willingness to study machinery and metal technology.

Students are not familiar with the industrial *Companies* in their local regions and companies in the metal industry were mostly unknown (Yli-Erkkilä 2002). In rural areas (Orimattila, Nastola) students are more familiar with industrial companies than in cities (Lahti, Heinola). Interview with career counselors in comprehensive schools showed that students in upper level do not want to have industrial companies in the cities, because *'they contaminate.'* In previous studies (Yli-Erkkilä 2002) the image of machinery and metal technology as a black smoke-pipe industry was evident, but this research did not confirm that image.

Generally students want personnel in companies to have positive attitudes towards young people but their opinion of those attitudes varies. In general upper secondary schools students consider them to be more positive than in vocational institutes. One-third of the students had no special interest in companies and one-fifth found the information about occupations from companies unimportant. One-third of the respondents found information about companies in local newspapers unimportant and half of the respondents found information about companies on local radio unimportant.

Macrolevel Elements and Factors

Many students do not have enough knowledge about opportunities in the Finnish *Education System*, although they reported that the joint application system is a good information source for educational and career choices. The Internet is important as an information source for one-third of students. Some students, however, found information from the Internet unimportant. One reason for this might be that the Internet and the new career counseling programs are not yet used extensively (Lairio and Puukari 1999). The other reason might be that not all career counselors feel they have the knowledge and skills to use ICT in their work (Numminen 2003).

Students want the content of the work in a career to be versatile and challenging, and some put emphasis on employment possibilities in the future and good wages (Morgan et al. 2001). Versatile and challenging work was stated to be the most significant attraction for most students in vocational upper secondary education and training. This brings up the question of the different expectations of work held by youth and their parents. What is the meaning of work? Is it to give security or satisfaction?

The model of attractiveness emphasizes the importance of the interaction between the *World-of-Work* and education. Lehtisalo and Raivola (1999) assert that education policy has to build routes for signals from the labor market to reach students and affect their decisions. They also feel that education policy needs to maintain a system in which educational institutions respond to the needs of economic life and the demand for students. The perceptions of the researchers are that stakeholders at the institutional level are going to have more impact on education than macrolevel stakeholders.

The present model of attractiveness contains three observation levels: microlevel, institutional level and macrolevel. The three aspects: the satisfaction path from education to career, and the development and interaction paths from workplace to educational institution can be best actualized by institutional initiatives. Thus, the results parallel those of Lehtisalo and Raivola (Ibid.).

Second Phase of Attractiveness Process, Remaining in Education and Training

As stated before, according to the constructed model of attractiveness the attractiveness of vocational education is not only understood in terms of the number of students entering vocational institutions but also in terms of the continuing process of the young student's educational pathway to working life.

The process model parallels with Peterson et al. (2002, 314) who define career development to be the implementation of a series of career decisions that constitute an integrated career path throughout the lifespan. Kurtelius (2002) has congruent viewpoints in the focal questions for the operation of educational institutions at present.

During the *second phase of the attractiveness process, remaining in education and training for completion*, the interaction factors become central. Having friends in the program was important for students, and particularly receiving their support. In the interviews, both students and career counselors in vocational institutes discussed the role of friends as 'bodygards.' Encouraging support from parents is needed and the students reported that they do receive it. Most of the students regarded the completion of education and training to be important.

Many students reported that their studies were not meaningful and the on-the-job-learning periods did not meet their expectations. Students reported that they had not had enough opportunities to show their competence in education and training, but they were also not satisfied with their own study activity. They want more information about employment opportunities in the sector at the beginning of their program.

Luopajärvi (1995) reports similarly. He has identified the factors that affect the motivation of students in upper secondary vocational education and training. Among these factors were: relationships between students, relationships between students and teachers (equity, support and encouragement, consideration) and meaningfulness of the studies.

8.3 Recommendations to Practitioners and Researchers

The next section provides recommendations to practitioners and researchers. The recommendations are general and they could concern the entire field of vocational upper secondary education and training. For more specific recommendations, the researcher advises the reader to examine Tables 33-37 to find factors of attractiveness in VET and Tables 54-58 to find the detractors and contributors to attractiveness for machinery and metal technology program. The relevant recommendations for each stakeholder group could be achieved by examining the detracting and contributing factors and by considering the performance of each stakeholder group. This can be accomplished for example by developing question series from the above-mentioned tables.

Recommendations to Practitioners

Macrolevel

National policies at the macrolevel could accelerate the recommended activities for stakeholders at the institutional and microlevel.

- Major changes should be made in career development practices starting with comprehensive schools and extending through career development practices and services in working life. This means that career development should not be understood only in terms of guiding and information delivery

practices, but as an interactive learning process for both the individual and participating stakeholders.
- Education and work together should be considered as a congruent whole, which implies the need for closer cooperation at the ministry level.

Institutional level

At the institutional level, the climate of the schools and professionally skilled teachers are important for students. These are considered the main sources for the attractiveness of study places.

- The limited developmental resources of educational institutions should be allocated as a priority to improve the skills of personnel and the working climate in the institutions.
- Vocational institutions should explicitly plan ways to make their educational programs meaningful for the students.

The development of career and education information delivery systems is essential to modern career guidance and marketing of vocational education.

- The different meanings that students and career counselors may make out of information should be discussed.
- New ways of information delivery should contain interactive delivery systems, so that they promote opportunities to catch interest among students.

Proximity of the school/institute was strongly important to the students. They even wish to walk to the school.

- Location of schools/institutes and the traffic services are significant to take into consideration in the regional plans.

In Finland several projects have been conducted to promote career counseling practices. The results of this research indicate that career counseling practices do not satisfy the needs of the new world-of-world. Career counselors continue to follow old policies and use old programs. The opportunities for choice of occupations and education are enormous, but career counselors are not able to manage alone any more.

- New models of lifelong career development and lifelong career counseling should be constructed. These models should combine both processes.
- This requires new language and new constructs for the practices and for the practitioners.
- Teachers and other personnel in the educational institutions should support the career development of students at every educational level.
- Career development learning should be part of the curriculum.
- Sufficient career development services should be provided for students in vocational education. These services should not be developed only for recruitment and information delivery purposes.

- Career development services and opportunities should be provided for personnel in working life as a part of the organizations' human resources development services.
- Vocational guidance at labor market offices and career counseling at educational institutions should complement and support each other and form a support network for life-long career development.

Young students have not enough opportunities for summer jobs in companies. The students do not know industrial companies, in fact they are not interested in companies, rather they are interested in the characteristics of the work they offer.

- Industrial companies should plan new ways to deliver interactively information of the content of the work inside the companies. This information should be provided for the students in comprehensive schools but it is also important to provide orientation and working opportunities for the students who have started their studies in vocational education.

Microlevel

At the microlevel students are not familiar with the education or occupation of their family members.

- Fathers, mothers and guardians should discuss their own educational and occupational pathways with their children and familiarize them with the world-of-work. Employers should support these activities.
- Young students have different views of work than their parents and grandparents. The expectations of the youth should be discussed and considered at home, in schools and at workplaces.

Recommendations to Researchers

The constructed model of attractiveness needs to be investigated further to become a comprehensive model of satisfaction for education and career in vocational upper secondary education and training.

Development of the Model

- Further development of the model should investigate the second phase of the process, remaining in education and training to completion. This research has identified the elements of the second phase and also some factors, but the framework is not yet complete.
- The third phase of the process, transition from education to occupation, needs more research. The elements and factors have not yet been investigated sufficiently.
- Finding measures, indicators and impacts of the elements and factors could be one way to develop the model further as a scientific model and as a tool for practitioners.
- The impacts of developmental work based on the model should be investigated through longitudinal research.
- The significance of various kinds of career development services in the career development process for students and adults should be determined. The models and processes for career development should include supports that will help students persist.

Research of Elements and Factors

- Interest research should be considered extensively in examination of career development in vocational education and throughout the lifelong process of career development.
- Interest and interest development for drop-outs from vocational education could generate new insights into the problem of social exclusion.
- The factors and effects of the relational context in different phases of the career development process should be examined further.
- It should be determined why students are not familiar with careers and education of their parents.
- The content and processes of interaction in career counseling should be examined.
- The effect of international education and career opportunities on the educational choices of young students should be examined.

Methodological Aspects

- Researchers should examine the potential of software available on personal computers for data analysis. These tools have various powerful options such as pivoting, filtering (MS Excel), data queries with required criterions and correlations (MS Access). These capabilities are beneficial for both qualitative and quantitative data analysis.

Recommendations to Both Researchers and Practitioners

- Extensive action research implemented by researchers and practitioners could generate new, innovative viewpoints and solutions for career development issues in education and working life.
- In research and practice issues at all levels should be considered from others' points of view. Communication with other stakeholders is a prerequisite for identifying and completing mutual actions.

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APPENDICES

APPENDIX 1 Preliminary Discussions Parties, Interview Sessions

Preliminary Discussion Parties

- Principal Jari Hautamäki, Lahti Vocational Institute, Lahti
- Managing Director Arpo Heinonen, Lahti Region Educational Consortium, Lahti
- Regional Agent Kari Hyytiä, Finnish Metalworkers' Union, Lahti
- Industrial Agent Kyösti Lintunen, Confederation of Finnish Industries, Lahti
- Doctor of Education Veijo Mäkelä, Lahti
- Education Manager Lasse Niemelä, Lahti Vocational Institute, Lahti
- Project Manager Vesa Raitaniemi, Lahti Mecatronics Network, Lahti
- Industrial Counsellor, Chairman of the Board Reino Rajamäki, Stala Group, Lahti
- Principal Päivi Saarelainen, Heinola Institute, Heinola
- Head of Department Marja-Terttu Tanttinen, Technology Industries of Finland, Helsinki
- Principal Kirsti-Liisa Virta, Orimattila Institute, Orimattila
- Advisor Jaakko Väyrynen, Technology Industries of Finland, Lahti Regional Office

Interview Sessions

Interviewee	Female/ Male	Position	Date
Teacher of machinery and metal technology	M	Vocational Institute	19.5.2003
Two students in machinery and metal technology program	M, M	Vocational Institute	19.5.2003 Group interview
Career counselor	M	Comprehenisve School	19.5.2003
Two students in machinery and metal technology program	M, M	Vocational Institute	21.5.2003 Group interview
Education manager in machinery and metal technology	M	Vocational Institute	21.5.2003
Career counselor	F	Vocational Institute	22.5.2003
Career counselor	F	Comprehensive School	28.5.2003
Career counselor	M	Comprehensive School	2.6.2003
Head master	M	Vocational Institute	10.6.2003
Metal worker	M	Metal Industry Company	23.6.2003
Human resources manager	M	Metal Industry Company	2.7.2003

APPENDIX 2 Themes of Focused Interviews

HOW TO ATTRACT STUDENTS TO … FOCUSED INTERVIEW FRAMEWORK

Interviewees:
VET school machinery and metal technology students
VET school teacher /career counsellor/ education manager/ principal
Comprehensive career counsellors
Representatives of company operating in the machinery and metal technology sector

Background information:
Age
Education
Professional history in brief

1. How would you define the word/concept 'attractiveness of vocational upper secondary education and training'?

2. What factors affect a young person's choice of training program in initial vocational education?

3. What factors affect students' active enrolment into training in the machinery and metal technology sector in particular?

4. How do the factors you listed contribute and which ones play a prominent role when the student is making his or her choice?

5. Have the factors changed in recent years; are they changing in the near future?

6. What different factors detract from or contribte to enrolling into vocational upper secondary education and training in the machinery and metal technology program? Have they changed in recent years or are they changing now?

7. What else can you tell about the attractiveness of initial vocational education in general or the machinery and metal technology program?

Student interview to include also

1. What makes machinery and metal technology an interesting training sector and place of study?

APPENDIX 3 Quotations in Finnish

Quotations from Short Essays

- *Meinasin mennä raksalle, mutta kuulin kaverilta metallialasta, kun heillä on oma yritys. Ja siksi metalli kun raksaa olen nähnyt eikä se kiinnostanut. L1*
- *Kuulin että tällä alalla työllistyy parhaiten ja palkat on kohtuullisia. H2*
- *Koska isäni on metallialalla ja kaverit on käynyt tämän linjan ja minua kiinnostaa. L3*
- *Oli Orimattilassa ja tykkään metallitöistä. O4*
- *Koska ei ole niin kauhean kaukana kotoa. L5*
- *Siksi koska mun numeroilla ei mihinkään lukioon päästä ja haluan enemmän tehdä käytännön töitä kun teoriaa. L6*
- *Hain ensisijaisesti autonkuljettajaksi, mutta en päässyt. Ja nyt olen tyytyväinen että pääsin metallialalle. L7*
- *Koska kaikki kaverit ovat myöskin Heinolan amiksesta. H8*

Quotations from Focused Interviews

Individual

- *Kiinnostus tarkoittaa, että on ittelle mielekästä työtä, ei joudu tekee sellasta mikä ei kiinnosta. (SQ1)*
- *Kiinnostus tuli ajan kanssa sitten. (EQ2)*
- *Koulutuspaikka voi tulla yllätyksenä, jos on vaikka viidentenä vaihtoehtona ja menee sitä kautta läpi. (CQ3)*
- *Jos vähän taustatietoja tsekkaa, niin ei sieltä semmoisia kovin, kovin selviä profiileita juurikaan löydy … sanoisin, että aika paljon on sattumaaki siellä joukossa sitten. (VQ4)*
- *Jos lähtökohta omille harrastuksille ja odotuksille, esimerkiksi autoala, niin vetovoimaisuus tulee niistä omista henkilökohtaisista mieltymyksistä. (VQ5)*
- *Mutta kyllä tää todistus aika lailla määrää tän, et kumman väylän ottaa enemmistön kohdalla. (CQ6)*

Social System

- *Pitää päästä pois vanhempien niskasta. Ukko potkii aina perseelle, että pitää mennä töihin. Ei se alana vaikuttanu. Vanhemmat ei oo vaikuttanu oikee millään tavalla. (SQ7)*
- *Mulla on faija samalla alalla ja on alkanu kiinnostaa, kun on nähny niitä töitä. (SQ8)*

- *Sit sellanen, tota isä tai äiti, joka just on lomautettu taikka muuta tällasta, niin eihän hän sitte niinku sano, että sinne pitää mennä töihin, vaan et sit pitää hakea jotain muuta. (EQ9)*
- *Kyllä joku sano, että rekkakuskina oleminen on mukavaa ja toinen sanoo, että ei ole. Ja yks sanoo, että tää ois hyvä homma ja toinen sanoo, että ei ole. Ja se on vähän miten kuulee ne asiat. (EQ10)*
- *Tutuilta kuultu, että on käynyt tässä oppilaitoksessa metallipuolen ja työharjoittelupaikoista ja palkoista yrityksissä. (SQ11)*

Comprehensive School

- *Meiän teknisen työn opettaja on kyl ottanu vähän sellasta asenteellista kantaa tähän, että hän yrittää lainausmerkeissä mainostaa ainakin pitää niinku esillä tän ammatillisen koulutuksen. (CQ12)*
- *Opot sun muut mollaa ammattikoulua ja niil on vahvasti sellai maine, et niist ei tuu mitää, ammattikoululaisist. (SQ13)*
- *Opot on aika realistisia, mutta pääohjaus kyllä tapahtuu lukion suuntaan. (VQ14)*
- *Luullaan, että peruskoulun jälkeen alkaa ikuinen loma ja enää ei tarvi tehä mitää ku tulee ammattikouluun, että ei se niin oo. (SQ15)*
- *Yläasteen teknisiä töitä on joko pidetty niissä (ammatillisen oppilaitoksen) tiloissa, tai sitte ihan meijän opettajatkin on vetäny niitä. (VQ16)*
- *Kyllä varmasti on vielä opettajia, jotka niin ku ikään ku toteaa, että jollet sä opiskele, niin sä joudut meidän yritykseen hitsaamaan tai jonnekin muualle hitsaamaan. (EQ17)*

Vocational Institute

- *Jos ammatti-instituutti täällä Lahdessa niin panostas tähän asiaan, että et tilannehan on ollu aika monia vuosia se, että oikeestaan ei oo oikeestaa vielä viittiny viedä oppilaita tuonne ammattikouluun, koska on ajatellu, et sit ne ei hae ainakaan. (CQ18)*
- *Tärkeää on että pääsee jalan liikkumaan, ja et ei aina tartte autoo. (EQ19)*
- *Into on kuitenkin sitte siihen koulutuksen jälkeiseen työhönkin jopa. Ne odottaa sitä työssä oppimista. (VQ20)*
- *Opetellaan käytännön asiat, alaa voin suositella, oppilaitosta en. (SQ21)*
- *Uusien asioitten opiskeleminen riippuu meistä ja meijän työharjoittelusta sun muista. (SQ22)*
- *Pitäisi nosta tasoa, valintakriteereitä. Pitäisi alkaa peruskoulussa jauhaa, et sinne ei pääse helpolla. (SQ23)*
- *Mut kyllähän nyt, kun instituuttiki on toiminu jo taikka tää ammatillinen oppilaitos kolmekytä vuotta niin oishan siinä jo voinu ehtiä tehdä yhteistyötä. (VQ24)*

- *Ei välttämättä niin, etteikö heillä ois kykyjä ja osaamista, mut ei oo päässy näyttämään sitä, taikka sit he on jo alisuoriutujaksi liukunu jo peruskoulun puolella. Niin, ni se, että se ne opinnot ois sillä tavalla järjestetty ja rakenneltu, että, että he niin ku pääsis näyttämään sitä osaamistaan, mikä on, mikä niin ku se kapasiteetti on. (VQ25)*
- *No niin ku mä sanoin tota, se on ihan siit kiinni, mikä on oma kiinnostus sitä kohtaan, että sehän on ihan yleisesti tiedossa, että ammattikoulun maine on vähän mitä on, että kaikki on vähän sillä silmällä, että ahaa, että ammattikoulun on käyny, että se on vaan paskanen duunari. (SQ26)*
- *Muutta kyllähän se silleesti ku rupee aattelee laajemmin sitä, että minkälaisen koulutuksen ne antaa ni kyllähän ne sitä kautta on hyvä maine, että ammattitaitosii työntekijöit sielt tulee, että tääki on silleesti vähän kakspiippunen juttu, et milt kantilt sit kattoo. (SQ27)*

Company

- *Elikkä tää niinku kuva just tätä ongelmakenttää, et tavallaan tehdään hyvässä, siis nää kouluihmiset, työvoimahallinnon ihmiset , kaikki tekee vilpittömästi ja hyvässä mielessä niinku työtä, mut jotain siit niin kun puuttuu. (EQ28)*
- *Toivoisin, että nuoret sais kesätöitä, kyllä se elämyksellinen tieto on kaikista parasta tietoa. Mutta tilanne on nyt valitettavasti se, että harva niistä pääsee minnekään töihin ja kyllä se siitä seuraa, ettei ne ihmeitä tiedä sitten siitä työelämän kuviosta. (CQ29)*
- *Liian vähän on yhteyksiä ja monesti sitten on jäänyt niin ku niin, että palataan asiaan, mutta ei sitä asiaan oo koskaan palattu. (EQ30)*
- *Tää jokapäiväinen toiminta on osa sitä yritysyhteyttä ja myöskin tällästä koulutusyhteistyötä alueen yrityksillä on. Silloin erittäin suuri merkitys, jos yritykset on aktiivisia. Joinakin aikoina ne ovat, joinakin eivät. Se on täysin suhdannekysymys. (VQ31)*
- *Alueella on työpaikkoja, sekin on sitten vielä tärkeää, ei mitkään kauniit kuvat tai kauniit sanat. (VQ32)*
- *…..… jos yritykset suhtautuu nuivasti nuoriin tavalla tai toisella. On se sitten kesätyöpaikka asiaa tai on se tet -jaksojen järjestelyä tai vierailuja tai vier… luentoja koululla tai kummiluokka toimintaa, jos yritykset ei tämmösiin lähde mukaan niin panostamaan ihan oikeasti eikä vain juhlapuheissa niin uskon, että tuota paljon vesitetään. (CQ33)*

Education System

- *Joku rohkastuu tekemään sen valinnan, ettei lähekään sinne lukioon, vaan oivaltaa, että tässähän on mulle hyvä väylä mennä tätä kautta ja siitä sitten on tiet auki eteenpäin. (CQ34)*
- *Suomalainen järjestelmä kyllä luo mahdollisuudet melkein mihin tahansa, että enemmänkin on kysymys siitä, että tää, muut tekijät saadaan toimimaan yh-*

teen, ja se on mielestäni hyvin pitkälle kyllä tahtotilakysymys enemmän kuin näitten järjestelmien tai osajärjestelmien niin kun rakenteista johtuva kaikista tärkeintähän on se, että sitte tää opiskelija osais sen hahmottaa. (VQ35)

- *Koko tää meiän koulutusrakenne tässä mielessä nää ammattikoulut, korkeakoulut ja nää nimikkeet on jo sellasia, että niitä on jo nytte niistä ei ymmärrä mitään (EQ36).*
- *Koulutusjärjestelmässä on tapahtunut nyt tätä muutoksia. On tullut esimerkiksi tämä ylioppilastutkinnon suorittamismahdollisuus rinnalla ja nuoret alkaa, alkaa kyllä mun mielestä hahmottaa näitä väyliä. (CQ37)*
- *Moni ajattelee, et lukioon kannattaa mennä, siit pääsee opiskeleen. Ammattikoululaiset pääsee kuitenkin töihin. (SQ38)*

World-of-Work

- *Uutisissa oli eläkepommista, että saa helposti töitä. (SQ39)*
- *Että tää, tää tuli justiin tuolla jossakin vaiheessa, että nimen, nimenomaan se, että pitäis saada yleisemmin tässä koulumaailman, onko se sitten työmaailman ja valtiovallan taholla niin ku sellanen ymmärrys todella aikaan, että, että teollisuutta tarvitaan, että ilman teollisuutta ja nimenomaan vientiteollisuutta, niin meil ei niin kun, me emme pysty toisiamme niin ku palvelemaan. (EQ40)*
- *Toisaalta sitte yritykset, yritysten ja, ja tällästen niin ku alan tunnetuks tekeminen, se, että alalla on hyvin työpaikkoja ja alueellisesti on työpaikkoja sekin on vielä sitte tärkeää, ja tota. Ne, niillä saadaan se vetovoimasuuden niin ku arvoa paljon enemmän, että, että tota, ei mitkään tälläset kauniit kuvat tai kauniit sanat, et kyll se niin ku sen ympäristön toimivuus ja, ja tota se tavallaan sen työnkin tekemisen hyvyys lisää sitä vetovoimasuutta. (VQ41)*
- *Mm, aikoinani asuin samalla kadulla, missä oli Metalli Yritys, et päivittäin tuli nähtyä. Ehkä siitä jäi sellanen mielikuva, et tänne haluun. (EQ42)*
- *No teollisuustyö ei, ei oo tuota niin, se on edelleenkin vaan, et ku mä kasiluokalla esimerkiks teetän sellasen tehtävän, siin on monta eri vaihetta, että ajatellaan, et perustetaan joku uus kaupunki, et mitä sinne ensin niin kun, et mitä, mitä kaikkia palveluja, tuotantolaitoksia, mitä siel tarvitaan, ni eipä sinne, aniharva piirtää tehtaita. Ja sit jos mä sanon, että missäs ne työpaikat on, ni no sinne johonki kaupungin reunalle, ei me tehtait haluta. …. Ja sitte, ja sitte tuota niin ruvetaan miettii, et mitä, mitä siel eri, eri työpaikois ni, mitä työntekijöitä siellä on, poliisilaitoksessa, virastoissa, kouluissa, sairaaloissa. Ja sit lopuks ne sijottaa niin ku luokan oppilaat, et mihin ne niin ku suorit, suorittais, joku työpaikka taikka, taikka sitte ihan ammatti siellä…….…...et ne on, ne on ne saastuttaa. Kukas se nyt haluais asua tehtaan naapurissa. (CQ43)*

The Elements of the Second Phase of the Attractiveness Process, Staying in Education

- *Jos on pyrkinyt alalle, niin pysyvyys jo takautuu sillä. Kakkos- tai kolmos-vaihtoehdolta joudutaan, niin herkemmin et pysy siellä. (VQ44)*
- *Jotkut on herkempii lähtee pois, ei sen vetovoiman takii, vaan muutenkin tälle nuorelle, että kun hän on tullut, olkoon perusteet mitkä hyvänsä, silloin niinku ruvettais luomaan sitä näkökulmaa, että mitä, mitä hyötyä tästä on ja mihinkä vielä voin päätyä ja minkälaisia mahdollisuuksia ala tarjoaa. (VQ45)*
- *Koulutus ei kiinnostanu valintavaiheessa, harrastuksille pitää jäädä aikaa. (SQ46)*
- *On parempi, että on kavereita, koska täälläki näkee kohtalaisen monii, ku niil on menny opiskelu päin helvettii sen takii ku niil ei oo ollu kavereita. Ku ei oo just kavereita ja se kaatuu koko homma siihe ku ei tääl jaksa olla. (SQ47)*
- *Kyl mä ainaki, mun mielestä se tulee pojilla vielä selvemmin esille, et tota on hirveen tärkee, että on semmonen niin ku oma, ei ne nyt henkivartioita oo, mutta semmonen turvaporukka ja, ja siellä aina sillon tällön tulee muutamia, ihan paikkakunnalta taikka, taikka niin ku kaikkein selvimmin se näkee, jos tulee jostaki toisesta yläasteesta. (VQ48)*

APPENDIX 4 Questionnaire Survey

QUESTIONNAIRE STUDY
November 2003

To whom it may concern,

I am doing research for my doctoral dissertation at the Research Centre for Vocational Education at Tampere University. The topic of my research is the attractiveness of vocational upper secondary education and training in the Lahti Region. Professor Juhani Honka is my supervisor.

This questionnaire is part of the research material I have collected. The questionnaire will be answered by students in selected vocational institutions, general upper secondary and comprehensive schools in the Lahti Region.

The research results are of importance when planning training in the Lahti Region and Finland as a whole. I hope you will be careful when answering the questionnaire. The information provided on the questionnaire will be considered confidential.

I will be happy to answer any questions concerning the questionnaire or the research as a whole.

Best Regards
Lena Siikaniemi

telephone 050 526 5997
e-mail lena.siikaniemi@phkk.fi

QUESTIONNAIRE **FOR VET STUDENTS**

Please answer the questions in both columns by ticking the correct alternative.
Questions in the first column are related to your choice of training sector and
the second column focuses on the status of your education and training today.
You can first answer all the questions on the left and then go on with the ones on the right.

		strongly important	important	not sure	mildly important	unimportant		strongly agree	mildly agree	not sure	mildly disagree	strongly disagree
1.	**When choosing the training sector**, information from joint-appilication procedure was for me .						I received sufficient information on training opportunities through joint-application procedure.					
2.	When choosing training sector, information obtained from VET school printed material was for me ..						I received sufficient information on my training sector from schools' printed material.					
3.	When choosing training sector, the esteem of the training was for me ..						Training offered by my school is appreciated.					
4.	When choosing training sector, the image of the VET school was ...						My school has a good image.					
5.	When choosing training sector, the opinion of graduates from the VET school was for me …						Graduates from my school spoke positively about it.					
6.	information from comprehesive school career counselor was for me…						I received sufficient information on my present training sector from career counselor.					
7.	When choosing training sector, information on local business life from career counselor was for me ..						I received sufficient information on local business life from career counselor.					
8.	When choosing training sector, my parents' attendance at school parents nights was for me …						My parents attended parents nights at my comprehensive school.					
9.	When choosing training sector, information on training sectors and occupations on the Internet was for me ..						Internet provided sufficient information for my choice of training sector and occupation.					
10.	When choosing training sector, information on VET school web site was for me …						School web sites provided sufficient information on my training sector.					
11.	When choosing training sector, as a source of information education fairs were for me …						Education fairs provided sufficient information on training sectors.					
12.	When choosing training sector, visits to companies with my teachers was for me …						We visited companies with our comprehensive schoo teachers.					
13.	When choosing training sector, company visits with career counselors were for me …						We visited companies with our career counselors.					
14.	When choosing training sector, comprehensive school teachers' descriptions of different occupations was for me ...						Comprehensive school teachers told about different occupations in class.					
15.	When choosing training sector, easy admission was for me …						It was easy for me to get admitted.					

Continues

		strongly important	important	not sure	mildly important	unimportant		strongly agree	mildly agree	not sure	mildly disagree	strongly disagree
16.	When choosing training sector, lessons by representatives of different sectors were for me ...						Representatives from different sectors held classes in comprehensive school.					
17.	When choosing training sector, information from VET school tutor student was for me …						VET school tutor student visited my comprehensive school.					
18.	When choosing training sector, information on companies from local papers was for me …						I follow business news in local papers.					
19.	When choosing training sector, information on companies from local radio was for me …						I follow business news on local radio stations.					
20.	When choosing training sector, information on local companies in the sector was for me …						I received sufficient information on local companies operating in the sector in application stage.					
21.	When choosing training sector, information about occupations given by companies was for me …						I received sufficient information on the occupations from the companies.					
22.	When choosing training sector, use of my practical skills during studies was for me …						I have been able to use my practical skills enough in studies.					
23.	When choosing training sector, use of my theoretical knowledge during studies was for me …						I have been able to use my theoretical knowledge enough in my studies.					
24.	When choosing training sector, a sector related to my hobby was for me …						I have obtained new knowledge and skills for my hobby through my studies.					
25.	When choosing training sector, encouraging support from my parents was …						My parents gave me encouraging support in my choice of training sector.					
26.	When choosing training sector, acquaintances in the sector were …						Some of my acquaintances work in the same sector.					
27.	When choosing training sector, picking a occupation other than my parents' was for me …						I study in the same sector as my parents did.					
28.	When choosing training sector, information on the sector from my parents was for me …						I received information on the training sector from my parents.					
29.	When choosing training sector, my parents' opinion was for me …						My parents opinion affected my choice of training sector.					
30.	When choosing training sector, success in studies was for me ...						My grades were not good enough to ensure admission to other training sectors.					
31.	When choosing training sector, polytechnic or university level further training opportunities were for me …						I have planned pursuing further studies at a polytechnic or university.					
32.	When choosing training sector, having friend/pals in the same school was for me …						I have friends/pals in the same school.					
33.	When choosing training sector, studying the curricula of the various training sectors was for me …						I received sufficient information on the curricula of the different training sectors.					

Continues

		strongly important	important	not sure	mildly important	unimportant		strongly agree	mildly agree	not sure	mildly disagree	strongly disagree
34.	When choosing training sector, acquiring a vocational qualification was for me …						My training will ensure a good occupation.					
35.	When choosing training sector, the result of the career guidance test was for me …						Results of career guidance test affected my choice of training sector.					
36.	When choosing training sector, ease of study was for me …						Studying is easy.					
37.	When choosing training sector, familiar school was for me …						I got to know the local VET schools while still at comprehensive school.					
38.	When choosing training sector, experience acquired during comprehensive school TET periods was for me …						I am satisfied with the comprehensive school TET periods.					
39.	When choosing training sector, proximity of the school was for me…						My VET school lies close to where I live.					
40.	When choosing training sector, knowing my future teachers in advance was for me …						I knew some of my present teachers from before.					
41.	When choosing training sector, demanding selection criteria were…						My training sector should have higher admission criteria.					
42.	When choosing training sector, knowing the occupational titles was for me …						I knew a number of occupational titles when choosing my training sector.					
43.	When choosing training sector, co-operation between initial VET and adult education was for me …						Initial VET and adult education should be kept separate.					
44.	When choosing training sector, quality of the operations of the school was for me …						Operations in my school are of high quality.					
45.	When choosing training sector, finding employment after the studies was for me …						My training offers good employment opportunities.					
46.	When choosing training sector, the well-structured educational program was for me …						In my sector the educational program is well-structured.					
47.	When choosing training sector, good school premises were for me…						My school has good premises.					
48.	When choosing training sector, good educational equipment and devoces were for me…						My school has good educational equipment and devoices.					
49.	When choosing training sector, safe climate in the school was for me …						Climate in my school is safe.					
50.	When choosing training sector, income level in the sector was for me…						Income level in my sector is good.					
51.	When choosing training sector, on-the-job training periods were for me…						I received information of on-the-job training in comprehensive school.					

Continues

		strongly important	important	not sure	mildly important	unimportant			strongly agree	mildly agree	not sure	mildly disagree	strongly disagree
52.	When choosing training sector, the unbiased information from comprehensive school career counselor on training opportunities was …							Information on various training opportunities from comprehensive school career counselors was unbiased.					
53.	When choosing training sector, the good food of the school offered was							My school offers good food.					
54.	When choosing training sector, good professional skills of my future teachers were for me …							Teachers in my school have good professional skills.					
55.	When choosing training sector, interest in the sector at the beginning of the studies was …							My interest in the sector has increased during my studies.					
56.	When choosing training sector, pursuing general upper secondary school studies along with vocational studies was …							I also pursue general upper secondary school studies.					
57.	When choosing training sector, the opinion of my friends/pals on the school was …							My pals'/friends' opinions affected my choice of VET school.					
58.	When choosing training sector, making a definite choice of the sector was …							I was certain of my choice of training sector.					
59.	When choosing training sector, knowing the opportunities of the Finnish education system was ..							I know the opportunities offered by the Finnish education system.					
60.	When choosing training sector, planning for the future was …							I have clear future plans.					
61.	When choosing training sector, experiences received in summer jobs were …							I have had a summer job in my training sector.					
62.	When choosing training sector, the positive attitude to young people by companies in the sector was …							Companies in my training sector take a positive attitude to the young.					
63.	When choosing training sector, the versatile and challenging nature of the occupation was …							My future occupation is versatile and challenging.					
64.	When choosing training sector, the tidyness of the work was …							Work in my training sector is tidy.					
65.	When choosing training sector, the fashionable image of the sector was …							My training sector has a fashionable image.					

Continues

		strongly important	important	not sure	mildly important	unimportant		strongly agree	mildly agree	not sure	mildly disagree	strongly disagree
66.	**In my studies, graduating for a occupation is for me ...**						I will complete my studies and graduate for an occupation.					
67.	In my studies, my friends'/pals' support is ….						My friends/pals support me in my studies.					
68.	In my studies, a safe study group is for me …						The group I study in is safe.					
69.	In my studies, belonging to a group of friends/pals is for me ….						I belong to a group of friends/pals.					
70.	In my studies, student counseling in VET school is for me …						I am satisfied with student counseling in my school.					
71.	In my studies, support from VET school support personnel is for me ..						I am satisfied with the support of the school support personnel.					
72.	In my studies, teachers' knowledge of working life is for me …						My teachers know working life well.					
73.	In my studies, own activity instudies is for me …						I am satisfied with my own activity in studies.					
74.	In my studies, on-the-job training periods are for me ….						On-the-job training periods have been useful.					
75.	In my studies, care for students shown by school personnel is for me …						Personnel in my school attend to the needs of the students well.					
76.	In my studies, the meaningful studies are for me …						My studies are meaningful.					
77.	In my studies, showing my own competence is for me ….						I am able to show my competence during studies.					
78.	In my studies, different level curricula are for me ….						Curriculum level is suitable.					
79.	In my studies, different project assignments are for me ….						I have had the opportunity to work on projects.					
80.	In my studies, information on employment opportunities in the sector are for me …						I have received information on employment prospects in the sector during my studies.					
81.	In my studies, a partner company with my class is for me …						My study group has a partner company.					
82.	In my studies, developing the activities of the school is for me …						Operations are developed sufficiently in my school.					
83.	In my studies, information on the sector from former graduates is for me …						Former students have come to my school to tell about the sector and their work.					
84.	In my studies, respect shown by companies in the sector towards my school is for me ….						Companies in the sector respect my school.					
85.	In my studies, my parents' encouraging support is for me …						My parents encourage me in my studies.					
86.	In my studies, preparing a personal study plan is for me …						A personal study plan has been drawn up for me.					
87.	In my studies, making final choice of the line at a later stage would be for me …						I am happy with the choice I made.					

Continues

Write your answer to the question on the line provided or encircle the correct alternative.

88. When did you get interested in your current training sector? _____

89. Why did you get interested in the sector? _____

_____

90. What work would you like to do in the future? _____

91. Could you study machinery and metal technology in a VET school? 1 yes 2 no

92. I could study machinery and metal technology in a VET school if _____

_____

93. I do not want to study in the sector because _____

_____

94. I know local industrial companies 1 yes 2 no

Name three _____

_____

_____

95. I know local metal industry companies 1 yes 2 no

Name three _____

_____

_____

96. Describe in your own words what makes the education and training sector attractive.

_____

_____

_____

Continues

Supply correct information on the line next to the question or encircle the correct alternative

97. Age _____ years

98. Sex Male 1 Female 2

99. Place of study _____

100. Current training sector _____

101. School background

comprehensive school	1
general upper secondary school	2
initial VET, line and year	3 _____

102. Were you admitted to your first choice place of study? 1 yes 2 no

103. What other sectors did you apply to? _____

_____

104. What training do your parents or guardians have?

	father	mother
elementary school	1	1
middle or comprehensive school	2	2
vocational qualification	3	3
post-secondary level qualification	4	4
matriculation examination	5	5
university degree	6	6
I do not know	7	7
other, what? _____	8	8

105. What are your parents' or guardians' occupational titles?

father/guardian _____

mother/guardian _____

106. My home town before training was _____

107. Present home town is _____

108. I live

with my parents or guardians	1
alone	2
with a friend/pal	3
in student dormitory	4
elsewhere, where? _____	5

109. Distance from place of residence to school _____ km?

Thank you!

APPENDIX 5 Abbreviations of the Response Groups

Abbreviation	Institute/School	Educational Field/Grade
LAIM	Lahti Vocational Institute	Machinery and metal technology
HIM	Heinola Institute	Machinery and metal technology
OIM	Orimattila Institute	Machinery and metal technology
LAIT	Lahti Vocational Institute	Heating, plumbing and ventilation
HIT	Heinola Institute	Motor vehicles and transport
OIT	Orimattila Institute	Electrical engineering
LSTO	Lahti College of Social Welfare and Health Care	Health Care and Social Services
HIO	Heinola Institute	Hotel and catering
OIO	Orimattila Institute	Youth and leisure instruction
NU	Nastopoli Upper Secondary School	1st grade
HU	Heinola Upper Secondary School	1st grade
KC	Kannas Comprehensive School	9th grade
OC	Orimattila Comprehensive School	9th grade

APPENDIX 6 Quantitative Data Analysis

Item	N	Mean	S.D.	Min	Max
1a	635	3,47	1,01	1	5
1b	635	3,82	0,99	1	5
2a	634	3,29	1,13	1	5
2b	634	3,70	1,04	1	5
3a	635	3,38	1,01	1	5
3b	632	3,75	0,93	1	5
4a	633	2,59	1,10	1	5
4b	632	3,64	0,94	1	5
5a	635	2,68	1,26	1	5
5b	632	3,57	1,00	1	5
6a	635	3,31	1,20	1	5
6b	634	3,56	1,25	1	5
7a	635	2,42	1,11	1	5
7b	633	2,83	1,12	1	5
8a	635	2,02	1,08	1	5
8b	634	3,28	1,51	1	5
9a	634	2,71	1,27	1	5
9b	634	3,27	1,15	1	5
10a	633	2,58	1,27	1	5
10b	634	3,15	1,14	1	5
11a	635	2,49	1,23	1	5
11b	632	3,13	1,13	1	5
12a	633	2,57	1,14	1	5
12b	633	2,76	1,45	1	5
13a	633	2,57	1,18	1	5
13b	633	2,91	1,46	1	5
14a	631	2,92	1,18	1	5
14b	633	3,15	1,34	1	5
15a	633	2,78	1,31	1	5
15b	632	4,05	1,04	1	5
16a	632	3,27	1,12	1	5
16b	631	3,39	1,29	1	5
17a	632	2,94	1,19	1	5
17b	631	3,40	1,39	1	5
18a	632	2,36	1,07	1	5
18b	629	2,10	1,21	1	5
19a	632	1,94	1,06	1	5
19b	630	1,70	1,05	1	5
20a	633	2,56	1,24	1	5
20b	631	2,93	1,21	1	5
21a	631	2,76	1,17	1	5
21b	630	2,80	1,19	1	5
22a	633	3,63	1,13	1	5
22b	629	3,41	1,08	1	5

Item	N	Mean	S.D.	Min	Max
23a	632	3,38	1,05	1	5
23b	630	3,73	0,94	1	5
24a	633	2,77	1,33	1	5
24b	629	2,73	1,36	1	5
25a	633	3,64	1,23	1	5
25b	630	3,85	1,08	1	5
26a	633	3,13	1,21	1	5
26b	630	3,51	1,30	1	5
27a	633	2,83	1,16	1	5
27b	629	1,89	1,25	1	5
28a	633	2,96	1,22	1	5
28b	630	2,82	1,34	1	5
29a	632	3,04	1,31	1	5
29b	630	2,56	1,35	1	5
30a	633	3,55	1,09	1	5
30b	630	2,07	1,29	1	5
31a	632	3,39	1,30	1	5
31b	630	3,37	1,38	1	5
32a	633	2,94	1,28	1	5
32b	629	3,77	1,44	1	5
33a	628	2,91	1,08	1	5
33b	630	3,16	1,10	1	5
34a	629	3,77	1,18	1	5
34b	628	4,25	0,88	1	5
35a	629	2,97	1,25	1	5
35b	628	2,77	1,27	1	5
36a	630	2,76	1,15	1	5
36b	627	3,19	1,10	1	5
37a	630	2,70	1,26	1	5
37b	628	3,20	1,28	1	5
38a	629	2,86	1,38	1	5
38b	628	3,78	1,21	1	5
39a	630	2,96	1,32	1	5
39b	626	3,38	1,46	1	5
40a	629	1,82	1,07	1	5
40b	628	2,32	1,52	1	5
41a	630	2,42	1,09	1	5
41b	628	2,60	1,15	1	5
42a	630	2,61	1,07	1	5
42b	628	3,22	1,10	1	5
43a	628	2,53	1,12	1	5
43b	628	3,09	1,10	1	5
44a	630	3,31	1,04	1	5
44b	628	3,70	0,91	1	5

Continues

Item	N	Mean	S.D.	Min	Max
45a	630	3,59	1,18	1	5
45b	627	3,52	1,07	1	5
46a	628	3,46	0,96	1	5
46b	628	3,60	0,95	1	5
47a	627	3,29	1,10	1	5
47b	628	3,81	0,97	1	5
48a	629	3,23	1,16	1	5
48b	626	3,71	0,98	1	5
49a	627	3,39	1,14	1	5
49b	628	3,91	0,91	1	5
50a	628	3,39	1,17	1	5
50b	628	3,21	1,05	1	5
51a	626	3,28	1,20	1	5
51b	628	3,38	1,10	1	5
52a	629	3,36	1,09	1	5
52b	625	3,37	1,17	1	5
53a	627	2,60	1,32	1	5
53b	624	3,68	1,08	1	5
54a	628	3,56	1,07	1	5
54b	625	3,75	0,89	1	5
55a	628	3,92	0,98	1	5
55b	624	3,67	1,09	1	5
56a	628	2,03	1,17	1	5
56b	625	1,60	1,13	1	5
57a	627	2,34	1,22	1	5
57b	625	2,28	1,31	1	5
58a	628	3,51	1,00	1	5
58b	624	3,79	1,20	1	5
59a	628	3,08	0,99	1	5
59b	624	2,99	1,10	1	5
60a	627	3,72	1,00	1	5
60b	625	3,37	1,23	1	5
61a	627	2,85	1,29	1	5
61b	624	2,94	1,71	1	5
62a	627	3,30	1,15	1	5
62b	625	3,40	0,92	1	5
63a	627	3,56	1,04	1	5
63b	625	3,70	0,97	1	5
64a	625	3,00	1,18	1	5
64b	625	3,17	1,10	1	5
65a	622	2,34	1,19	1	5
65b	625	3,07	1,24	1	5
66a	627	4,10	1,01	1	5
66b	426	4,26	1,12	1	5

Item	N	Mean	S.D.	Min	Max
67a	626	3,57	1,11	1	5
67b	426	3,80	1,08	1	5
68a	627	3,72	1,01	1	5
68b	426	4,11	0,91	1	5
69a	626	3,72	1,09	1	5
69b	426	4,30	0,98	1	5
70a	626	3,38	1,02	1	5
70b	426	3,54	1,06	1	5
71a	627	3,00	1,02	1	5
71b	426	3,27	0,98	1	5
72a	627	3,35	1,03	1	5
72b	426	3,70	0,95	1	5
73a	627	3,91	0,97	1	5
73b	426	3,40	1,13	1	5
74a	627	3,63	1,10	1	5
74b	426	3,29	1,00	1	5
75a	625	3,32	1,01	1	5
75b	426	3,47	0,99	1	5
76a	627	4,08	0,93	1	5
76b	426	3,67	1,07	1	5
77a	627	3,81	0,97	1	5
77b	426	3,67	0,99	1	5
78a	624	3,24	0,91	1	5
78b	425	3,52	0,94	1	5
79a	625	3,21	1,07	1	5
79b	426	3,28	1,20	1	5
80a	627	3,54	1,04	1	5
80b	425	3,34	1,15	1	5
81a	627	2,54	1,01	1	5
81b	426	2,03	1,09	1	5
82a	625	3,08	1,03	1	5
82b	426	3,15	0,97	1	5
83a	627	3,04	1,10	1	5
83b	423	2,40	1,23	1	5
84a	625	3,12	1,03	1	5
84b	426	3,23	0,84	1	5
85a	626	3,74	1,11	1	5
85b	425	4,03	1,01	1	5
86a	624	3,23	1,05	1	5
86b	423	2,78	1,39	1	5
87a	623	3,57	1,01	1	5
87b	427	4,08	1,05	1	5

APPENDIX 7 Frequency Distribution

Element	Item	1,00	2,00	3,00	4,00	5,00	Total
Individual	22a	5,06	14,38	15,96	42,18	22,43	100
	23a	4,59	18,20	22,94	43,04	11,23	100
	24a	24,49	17,22	27,49	18,64	12,16	100
	30a	4,90	14,85	18,17	45,02	17,06	100
	34a	6,84	8,59	17,01	35,45	32,11	100
	35a	18,28	14,47	29,73	27,34	10,17	100
	36a	15,08	29,05	26,67	23,17	6,03	100
	55a	1,91	9,08	14,01	45,38	29,62	100
	58a	3,03	11,78	32,32	36,78	16,08	100
	60a	1,91	13,24	16,59	47,53	20,73	100
Social	25a	7,11	15,01	12,16	38,70	27,01	100
System	26a	13,11	18,17	20,85	38,23	9,64	100
	27a	19,27	12,48	40,92	20,85	6,48	100
	28a	16,11	19,43	25,28	30,49	8,69	100
	29a	16,61	20,89	16,61	33,54	12,34	100
	32a	15,96	26,38	16,90	29,70	11,06	100
	57a	33,65	23,92	21,05	17,38	3,99	100
	8a	43,94	22,36	22,52	9,92	1,26	100
Comprehensive	12a	23,85	20,06	34,60	18,01	3,48	100
School	13a	26,07	18,01	32,70	19,43	3,79	100
	14a	13,79	25,67	21,71	32,33	6,50	100
	16a	9,34	14,24	26,42	39,72	10,28	100
	38a	22,89	19,87	19,40	23,69	14,15	100
	51a	10,06	15,81	25,72	32,75	15,65	100
	52a	7,95	12,56	26,71	41,34	11,45	100
	6a	10,39	17,64	15,43	43,94	12,60	100
	7a	29,45	17,17	37,48	14,02	1,89	100
Company	18a	29,43	20,57	36,23	12,50	1,27	100
	19a	50,79	10,92	32,12	5,38	0,79	100
	20a	27,33	22,59	20,06	26,54	3,48	100
	21a	19,02	21,39	29,79	24,56	5,23	100
	61a	22,33	14,19	30,46	22,65	10,37	100
	62a	9,57	12,60	30,46	32,70	14,67	100
Education	1a	4,88	10,55	30,08	41,42	13,07	100
System	31a	11,87	13,61	22,15	28,48	23,89	100
	56a	50,64	8,28	31,21	7,01	2,87	100
	59a	8,28	14,65	44,11	27,07	5,89	100
	9a	22,87	23,50	20,19	26,66	6,78	100

Continues

	Item	1,00	2,00	3,00	4,00	5,00	Total
Vocational	10a	27,33	22,43	20,54	24,17	5,53	100
Institution	11a	28,98	21,89	25,67	18,43	5,04	100
	15a	22,27	22,27	21,64	23,22	10,58	100
	17a	18,20	12,34	32,44	30,85	6,17	100
	2a	7,26	20,82	18,77	42,43	10,73	100
	33a	12,10	20,86	36,94	24,20	5,89	100
	37a	23,97	20,63	23,49	25,71	6,19	100
	39a	17,62	23,49	16,67	29,84	12,38	100
	3a	4,88	15,75	24,41	45,98	8,98	100
	40a	56,44	14,15	21,78	5,88	1,75	100
	41a	28,73	16,19	41,43	11,27	2,38	100
	43a	26,27	15,13	40,61	15,13	2,87	100
	44a	5,56	17,46	27,14	40,16	9,68	100
	46a	3,18	13,38	27,71	45,22	10,51	100
	47a	5,90	22,01	20,57	40,67	10,85	100
	48a	7,95	21,78	22,73	34,50	13,04	100
	49a	6,86	16,75	22,49	37,96	15,95	100
	4a	19,59	27,49	29,70	20,54	2,69	100
	53a	28,87	20,10	21,53	21,53	7,97	100
	54a	5,25	12,42	19,43	46,50	16,40	100
	5a	23,31	24,25	20,16	26,14	6,14	100
World-of-Work	42a	18,89	25,24	35,08	17,94	2,86	100
	45a	6,51	12,70	21,59	33,65	25,56	100
	50a	6,21	19,59	21,82	33,76	18,63	100
	63a	3,83	12,12	26,32	39,87	17,86	100
	64a	14,08	17,28	32,16	27,20	9,28	100
	65a	34,89	16,08	32,96	12,06	4,02	100
Remaining	66a	2,07	7,02	12,44	35,73	42,74	100
in Education	67a	4,79	15,50	16,93	43,29	19,49	100
	68a	2,71	11,32	18,50	46,57	20,89	100
	69a	3,83	13,58	13,74	44,09	24,76	100
	70a	3,83	18,05	25,56	41,53	11,02	100
	71a	8,61	21,21	36,84	28,07	5,26	100
	72a	5,10	14,67	31,74	37,00	11,48	100
	73a	1,44	9,89	13,24	47,05	28,39	100
	74a	4,94	10,85	22,65	38,92	22,65	100
	75a	3,36	19,04	31,04	35,84	10,72	100
	76a	0,80	7,50	11,80	42,26	37,64	100
	77a	1,59	11,16	15,63	48,01	23,60	100
	78a	2,24	17,47	41,51	31,25	7,53	100
	79a	5,28	21,60	31,36	30,56	11,20	100
	80a	3,03	13,88	28,07	36,36	18,66	100
	81a	22,49	15,31	50,08	10,21	1,91	100
	82a	7,20	20,00	37,76	27,52	7,52	100
	83a	9,73	22,97	27,75	32,85	6,70	100
	84a	7,36	18,08	36,96	30,24	7,36	100
	85a	3,51	14,06	14,38	40,58	27,48	100
	86a	5,93	17,95	33,01	33,01	10,10	100
	87a	3,85	7,87	34,67	34,35	19,26	100

APPENDIX 8 Gap Analysis Results

item	LAIM	HIM	OIM	LAIT	HIT	OIT	LSTO	HIO	OIO	NU	HU	KC	OC
1	0,38	0,90	0,31	0,48	0,05	0,25	0,59	0,70	0,07	0,31	0,47	0,21	0,07
2	0,45	0,20	0,46	0,23	-0,24	0,69	0,60	0,33	0,13	0,88	0,95	-0,07	0,22
3	0,43	0,30	0,23	0,52	-0,10	1,00	0,60	0,63	-0,13	0,53	0,66	0,04	0,03
4	0,92	0,80	1,08	1,08	0,49	1,19	1,49	0,85	1,40	1,23	1,24	0,87	0,80
5	0,72	0,50	0,00	1,10	0,76	0,88	1,35	0,98	1,06	1,02	0,93	0,83	0,66
6	0,19	-0,20	0,69	0,10	0,57	1,13	0,05	-0,07	0,40	0,14	0,41	0,14	0,40
7	0,21	0,40	0,31	0,32	0,52	1,50	0,14	-0,08	0,00	0,61	0,74	0,32	0,50
8	0,96	1,10	0,85	1,39	1,29	1,38	1,19	1,20	0,87	1,78	1,63	0,88	1,25
9	0,42	0,50	0,92	0,74	0,76	1,06	0,60	0,48	0,13	0,84	0,85	0,22	0,41
10	0,57	0,00	0,92	0,94	0,62	1,13	0,59	0,48	0,00	0,73	0,82	0,22	0,46
11	0,45	-0,10	0,77	0,74	0,29	1,25	0,69	0,55	-0,20	0,84	1,09	0,46	0,55
12	-0,13	0,30	0,08	0,19	0,19	0,69	-0,11	-0,08	0,07	-0,01	0,17	0,16	0,73
13	-0,15	0,70	0,85	0,13	0,71	1,00	0,05	0,05	0,00	-0,17	0,43	0,40	0,94
14	0,43	0,30	-0,08	0,17	0,81	0,69	0,16	0,68	0,07	0,39	-0,06	-0,06	0,31
15	1,32	1,00	1,31	1,71	1,20	1,50	1,62	0,98	0,53	1,74	2,16	0,38	0,87
16	0,19	0,10	0,54	-0,03	0,29	0,69	-0,05	0,28	-0,33	0,47	0,24	-0,15	0,02
17	0,30	0,10	0,62	0,45	0,38	0,63	-0,02	0,23	0,00	0,83	0,84	0,28	0,66
18	-0,28	-0,50	-0,23	-0,10	-0,19	0,38	-0,19	-0,33	-1,13	0,13	0,07	-0,38	-0,62
19	0,04	-0,20	-0,08	-0,13	-0,14	-0,13	-0,31	-0,20	-0,53	0,11	-0,28	-0,35	-0,49
20	0,15	-0,20	0,00	0,23	-0,10	1,00	0,33	0,02	0,33	1,19	0,80	0,08	0,19
21	0,04	-0,50	0,08	-0,31	-0,48	0,56	0,05	-0,10	0,13	0,66	0,20	-0,19	-0,01
22	-0,02	-0,10	0,00	-0,03	-0,19	0,00	-0,62	-0,05	-0,73	0,06	0,03	-0,51	-0,27
23	0,23	0,80	1,31	0,94	0,29	0,94	0,44	0,43	0,53	0,13	0,55	-0,21	0,31
24	0,58	0,60	0,00	0,06	0,29	0,50	0,23	0,15	-0,27	-0,06	0,28	-0,45	-0,69
25	0,32	0,70	0,54	0,23	0,48	0,56	0,26	0,25	0,33	0,11	0,56	-0,11	-0,04
26	0,74	0,80	1,23	0,97	0,67	0,94	1,12	0,70	0,87	0,06	0,17	-0,13	-0,20
27	-0,32	-1,60	-0,23	-1,23	-0,38	-0,56	-0,64	-1,13	-1,87	-0,91	-0,90	-1,13	-1,26
28	0,09	-0,30	-0,46	-0,06	-0,38	-0,06	-0,36	0,20	-1,07	-0,16	-0,01	-0,14	-0,13
29	-0,32	-0,80	-0,77	-0,77	-0,62	-0,25	-0,78	-0,85	-1,27	-0,31	-0,14	-0,50	-0,32
30	-0,60	-1,00	0,46	-0,90	-0,67	-1,00	-1,47	-0,90	-0,53	-2,33	-2,47	-1,23	-1,76
31	-0,28	-0,20	0,23	0,13	-0,10	0,50	0,21	0,15	0,13	0,28	-0,03	-0,24	-0,22
32	0,89	1,10	0,77	2,10	1,62	1,25	1,75	1,00	1,47	1,36	1,33	-0,30	-0,41
33	-0,06	0,40	0,38	0,63	0,38	1,00	0,43	0,00	-0,40	0,59	0,31	0,08	0,06
34	0,11	0,20	0,54	0,48	-0,10	0,31	0,01	0,23	-0,33	1,75	1,67	-0,03	0,06
35	0,00	0,10	0,08	-0,58	0,19	0,00	-0,44	-0,33	-1,13	0,11	-0,17	-0,22	-0,14
36	0,36	0,80	-0,23	1,06	0,48	0,38	0,73	0,15	0,67	0,28	0,77	0,07	0,29
37	0,23	0,10	-0,23	0,32	0,24	1,56	1,38	-0,05	0,53	-0,08	0,40	0,58	0,62
38	0,53	0,20	1,54	0,94	0,33	1,25	0,84	0,90	0,33	1,48	1,34	0,47	0,99
39	0,04	0,00	0,62	0,19	0,12	0,75	0,72	0,23	-1,05	0,66	1,16	-0,14	0,47
40	-0,13	-0,60	0,38	0,00	0,24	0,13	0,19	0,08	-0,57	0,80	2,02	0,15	0,60

Continues

item	LAIM	HIM	OIM	LAIT	HIT	OIT	LSTO	HIO	OIO	NU	HU	KC	OC
41	-0,06	-0,20	0,54	0,42	0,43	0,63	0,48	0,15	-0,07	0,13	0,35	-0,25	0,14
42	0,58	0,10	0,54	0,55	0,52	0,69	0,93	0,30	0,33	0,84	1,13	0,19	0,43
43	0,68	0,60	0,92	1,65	0,43	1,19	0,22	0,43	-0,87	0,64	1,33	0,13	0,28
44	0,38	0,80	0,77	0,74	-0,10	0,75	0,44	0,38	0,20	0,70	0,22	0,32	0,24
45	0,26	-0,10	0,15	0,03	-0,14	0,38	-0,12	-0,02	-0,80	-0,18	-0,25	-0,15	0,02
46	0,47	-0,10	0,54	0,52	0,52	0,69	0,11	-0,04	-0,20	0,20	0,43	-0,20	-0,22
47	0,47	0,20	0,38	0,55	0,10	0,81	0,99	0,55	1,07	0,73	0,46	0,25	0,35
48	0,30	0,10	0,62	0,61	-0,33	0,81	1,11	0,63	0,93	0,72	0,52	0,15	0,16
49	0,58	0,10	0,15	0,71	0,24	0,81	0,95	1,12	0,87	0,61	1,02	-0,14	-0,01
50	0,15	0,00	-0,15	0,55	-0,43	0,25	-0,35	-0,03	-0,67	0,25	0,27	-0,76	-0,58
51	0,15	0,50	-0,15	0,61	0,06	0,63	-0,32	0,11	-1,33	0,30	0,55	-0,08	0,01
52	-0,11	0,30	0,08	0,40	-0,05	0,31	0,06	-0,23	-0,20	0,17	-0,20	0,02	0,07
53	0,91	1,20	0,54	1,09	1,05	0,63	2,28	1,56	1,53	1,26	1,53	0,35	0,33
54	0,42	1,10	0,31	0,79	-0,33	1,06	0,49	0,46	0,80	0,25	0,02	-0,07	-0,32
55	-0,04	-0,40	-0,62	-0,21	-0,10	0,19	-0,21	-0,26	-0,80	-0,38	-0,42	-0,05	-0,28
56	-0,08	-0,30	-0,08	-0,05	-0,14	0,00	-0,36	-0,23	-0,80	-0,66	-0,69	-0,48	-0,59
57	-0,04	-0,50	0,08	-0,34	0,14	0,25	-0,02	-0,38	-0,33	0,11	-0,06	-0,17	0,06
58	0,30	0,10	0,38	-0,12	0,24	0,31	0,44	0,26	-0,07	0,17	0,46	0,23	0,26
59	-0,19	-0,70	-0,08	-0,14	-0,10	0,50	0,16	0,15	-0,27	-0,05	0,02	-0,15	-0,38
60	0,25	-0,50	-0,31	0,05	-0,05	-0,38	-0,23	-0,59	-0,40	-0,33	-0,69	-0,52	-0,38
61	-0,34	-0,10	-0,69	-0,37	-0,52	-0,56	-0,12	-0,64	-0,04	1,49	1,48	-0,37	-0,35
62	0,17	-0,10	0,15	0,41	0,10	-0,06	0,18	0,00	0,13	0,73	0,61	-0,41	-0,37
63	0,28	0,10	0,31	0,47	-0,14	0,94	0,28	0,38	0,20	0,61	-0,09	-0,06	-0,21
64	-0,04	-0,20	-0,23	0,15	-0,30	0,94	0,43	0,13	0,73	0,53	0,26	-0,16	0,05
65	0,09	0,00	0,08	0,04	0,29	0,31	0,57	0,77	-0,27	1,22	1,41	0,67	0,97
66	0,50	0,30	0,54	0,31	0,21	0,44	0,01	0,15	0,07	0,36	-0,01		
67	0,48	0,30	0,77	0,26	0,32	0,50	0,47	-0,30	-0,13	0,33	0,28		
68	0,37	-0,10	0,85	0,15	0,58	0,63	0,52	0,60	0,20	0,36	0,45		
69	0,62	0,40	0,62	0,48	0,26	1,13	0,46	0,60	0,20	0,47	0,59		
70	0,19	0,20	0,46	0,78	0,11	1,00	0,21	-0,10	0,47	0,52	0,13		
71	0,35	0,20	0,08	0,70	0,00	0,69	0,56	0,30	0,07	0,52	0,33		
72	0,21	0,60	0,46	0,52	-0,74	0,63	0,44	0,58	0,40	0,30	0,47		
73	0,02	-0,20	0,23	-0,29	-0,05	-0,56	-0,52	-0,63	-1,00	-0,70	-0,67		
74	-0,27	-0,60	-0,46	-0,30	-0,37	-0,44	-0,99	-0,58	0,07	-0,06	0,15		
75	0,43	0,30	0,23	0,00	-0,28	0,63	0,05	0,23	0,27	0,34	0,24		
76	0,29	0,20	-0,46	-0,04	-0,53	0,13	-0,31	-0,25	-0,73	-0,44	-1,01		
77	0,00	-0,50	0,15	0,26	-0,21	-0,13	-0,12	-0,33	-0,07	-0,14	-0,22		
78	0,17	0,20	0,38	0,56	0,00	0,69	0,41	0,25	0,30	0,39	0,37		
79	-0,04	0,00	-0,23	-0,33	0,39	-0,25	0,73	-0,35	-0,07	0,02	0,21		
80	0,04	0,20	-0,38	0,29	-0,21	-0,06	-0,07	-0,25	-0,60	-0,19	-0,74		
81	-0,02	-0,80	0,00	0,02	0,16	-0,63	-0,73	-0,93	-1,07	0,02	-0,36		
82	0,38	0,10	-0,08	0,42	0,16	0,19	0,20	-0,13	-0,20	0,33	-0,08		
83	-0,33	0,00	-0,38	-0,57	-0,40	-0,31	-0,44	-0,43	-0,93	-0,60	-0,62		
84	0,27	-0,10	-0,08	0,42	0,42	0,38	0,31	0,20	-0,07	0,30	0,16		
85	0,31	0,50	0,69	0,38	0,25	0,81	0,33	0,14	0,60	0,28	0,44		
86	-0,37	-0,60	-0,54	-0,40	-1,01	-0,50	0,20	-0,80	-1,41	-0,31	-0,37		
87	0,25	0,90	0,77	0,86	0,89	0,94	0,36	0,24	0,33	0,95	0,48		