# The relationship between learning environment and career competencies of students in vocational education

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## ARTICLE INFO

## ABSTRACT

This article focuses on which aspects of the learning environment, aimed at fostering career learning, correspond with the development of career competencies among students (aged 12–19 years) enrolled in prevocational and secondary vocational education in The Netherlands. Aspects of the learning environment that are taken into account here are the following: career orientation and guidance methods used, instruments implemented, and the degree to which the curriculum is practice-based and dialogical. In the study, three career competencies are identified: career reflection (reflective behaviour), career forming (proactive behaviour), and networking (interactive behaviour). To research the relationship between the learning environment and the presence of career competencies, a study was done among 3499 students and 166 teachers in 226 classes in 34 schools. The results show that career guidance in school, in which a dialogue takes place with the student about concrete experiences and which is focused on the future, contributes most to the presence of career competencies among students. Without this dialogue, career guidance methods and instruments barely contribute to the acquisition of career competencies.

## Introduction

Although in Western societies, employers expect that new employees will have more knowledge, more skills, and will be more intrinsically motivated than employees were two decades ago (Bailey, Hughes & Moore, 2004), vocational education does not fulfil these expectations. There are indeed serious doubts about the motivation and the level of knowledge and skills students have (Boutin et al, 2009; Billett, 2009). An important reason for these disappointing results seems to be the fact that most students fail to develop a clear career wish (let alone a career identity) during their time at school (Geurts & Meijers, 2009). Lack of intrinsic motivation (Plane, 2009) results in students making rather random career choices, and this, in turn, results in high dropout rates. In recent years, schools for vocational education in the European Union are increasingly investing in career guidance (Company, 2009). At the same time, it is clear that the school managers have little or no vision regarding career guidance and counselling; they simply invest in doing more of the same (i.e., repeating the same established but ineffective guidance activities) (Meijers, 2008). In part, the lack of a clear vision among managers is the result of the lack of consensus about what constitutes effective career guidance in an educational context (Law, 2005; OECD, 2004).

*Career learning: theoretical perspectives*

In Western nations, career guidance in education is primarily based on the trait-and-factor approach (European Commission & OECD, 2004; Sultana, 2004; Irving & Malik, 2005; Watts & Sultana, 2004). In this approach which—through the work of Holland

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(1973, 1985)—had a huge influence on the shape and content of career guidance and counselling in education, the concepts 'informed choice' and 'decision making' are key. In this model, a good career choice is made when the personality and the talents of a potential employee match with the required knowledge and skills of the job in question. Therefore, counsellors and teachers should provide students with reliable information about their talents and with information about the knowledge and skills that are needed to carry out particular jobs. The idea here is that students can then make rational choices regarding their careers.

The limitations of this model are now becoming evident. One's career path has become more and more unpredictable (e.g., notion boundaryless career; Arthur, Khapova & Wilderom, 2005), and therefore, it is increasingly difficult to make rational and information-based career choices (Mitchell, Levin & Krumboltz, 1999; Guindon & Hanna, 2002). The idea that students even have the cognitive ability to make rational career choices is also being challenged. Three decades ago, Simon (1983) observed that people were not able to make rational decisions because they do not have all the facts, do not have a consistent value system, and, furthermore, do not possess sufficient reasoning skills. Humans have a 'bounded rationality' that basically only allows them to engage in 'irrational behaviour' (Tersky & Kahneman, 2000). Youths, in particular, are only capable of a short-term perspective; they only concentrate on one problem at a time (Coleman, 1989). Neurological and neuropsychological research explains this 'bounded rationality' among youths exists because their prefrontal cortex (part of the brain responsible for choice-making) only develops fully between age 20 and 30 years (Gladwell, 2006). Therefore, young people when faced with complex situations will, generally, jump to conclusions (Stuss & Anderson, 2003; Schwartz, 2004).

As a result of knowing that it is impossible to provide accurate information about the individual and/or the labour market, combined with the insight that young people are not yet capable of making conscious and informed choices, career guidance and counselling in the traditional way is becoming more and more obsolete (Hughes & Karp, 2004; Richard, 2005). The result is not advantageous for students, especially when one considers that "as the educational system multiplies choices, and in a market-based system the consequences of choices become ever more important, actual responsibility for making decisions falls mainly on students" (Connell, 2003, p. 245). Students should not be provided with more (or even better) information just before a decision needs to be made but should be helped to learn how to gather their own information and to transform this information—by developing career competencies—into meaningful knowledge and actions with regard to self, work, and career. Kuijpers and Scheerens (2006) and Kuijpers, Schyns, and Scheerens (2006) identify five distinctive career competencies: capacity reflection (observation of capabilities that are important for one's career), motivation reflection (observation of wishes and values that are important for one's own career), work exploration (researching job possibilities), career directedness (making thoughtful decisions and taking actions that allow work and learning to correspond with one's capabilities and motivation and challenges at work), and, finally, networking (building and maintaining contacts focused on career development). It is clear that developing career competencies is a higher-order learning process that needs a nontraditional learning environment. This begs the question as to what a powerful career learning environment really is and places finding that out firmly on the agenda.

*Career learning*

The first career-development theories with a learning perspective emphasized reproductive learning (i.e., learning whereby no personal meaning is attributed to the information; Bateson, 1979). These are the theories that build forth on Bandura's (1986) social cognitive theory (Krumboltz, 1996; Krumboltz & Worthington, 1999; Lent, Hackett & Brown, 1999). The main idea here is that the choice of occupation is the result of an interaction among career-oriented self-efficacy, outcome expectations, and goals. Confidence in efficacy and expectations about the outcomes of actions is seen as the result of two learning processes: positive or negative reinforcement that result from successful and failed learning experiences and 'vicarious learning,' which, in essence, is the imitation of behaviour that is valued positively by the group one wants to be a part of. Self-confidence combined with positive expectations about one's actions generates occupational desires. On the basis of these desires, career decisions are taken and occupations are chosen. Learning experiences and the space to have them are partly determined by ethnicity and gender (Byars & Hackett, 1998).

In a quickly changing environment, it is difficult to adequately describe career learning processes using social cognitive learning theories. In the current global economy, jobs change so quickly that it is not easy for an increasing number of individuals to learn vicariously, while the presence of the boundaryless career makes it problematic to develop concrete outcome expectations with regards to one's career path (Mitchell, Levin & Krumboltz, 1999; Guindon & Hanna, 2002). In addition, in social cognitive learning theory, social experiences are seen as external influences on decisions, whereas empirical research suggests that they are in fact an integral part of the decision-making process itself (Hodkinson & Sparkes, 1997; Law, 1996; Heinz, 2003; Heinz & Marshall, 2003; Heinz & Taylor, 2005). To understand career development in a turbulent context, a more 'agentic theory' is needed.

Such an approach is offered by constructivist learning theory (Hua Liu & Matthews, 2005; Fox, 2001; see Savickas, 2002, 2005, for career learning); it is based on the idea that learning is a process in which the learner transforms information into meaningful knowledge. It is a process of "becoming critically aware of one's own tacit assumptions and expectations and those of others and assessing their relevance for making an interpretation" (Mezirow, 2000, p. 4). In the constructivist view, meaning is constructed—by creating a story—from information through a dialogue with one self and others about real-life experiences (Bruner, 1990; Lengelle & Meijers, 2009; Hermans & Hermans-Konopka, 2010).

*A career learning environment in education*

In an educational context, career stories (Savickas, 2002, 2005) emerge in a dialogue in which personal meaning is attached to concrete experiences with work: the learning environment has to be practice-based and dialogical (Bailey, Hughes & Moore, 2004; Hodkinson & Sparkes, 1997). To achieve a dialogue, the thoughts and feelings of students with respect to their work experiences must be given a central place in the conversation (Philip, 2001; Bardick, Bernes, Magnusson & Witko, 2006). The dialogue cannot be a one-off discussion but must be a form of ongoing support (Riverin-Simard, 2000; Harrington & Harrigan, 2006). Students, however, do not seem to participate in a career dialogue willingly; they are hardly motivated to participate in reflective activities about their careers when these are prescribed as part of the curriculum (Law, Meijers & Wijers, 2002; Mittendorff, 2010). Owing to the highly theoretical nature of the school curriculum, they do not see the connection between these reflective activities and 'real life' and, therefore, regard reflection with the help of portfolios or personal development plans as useless (Mittendorff et al., 2008). Research of Weick, Sutcliffe and Obstfeld (2005) and Mittendorff (2010) suggests that a learning environment in which students can make their own choices improves their motivation and ability to give direction to their careers.

A career-oriented learning environment (i.e., a learning environment that stimulates the development and application of career competencies) is—taking into account the research findings presented—probably an environment in which the student can get real-life work experience (i.e., a problem-based curriculum), has a say in his/her own learning process (i.e., an inquiry-based curriculum), and, finally, can participate in a career-oriented dialogue about his/her learning experiences with work. Such a learning environment differs in many ways from a traditional learning environment:

* not primarily focused on information transfer but oriented towards obtaining actual work experiences,
* not focused on a monologue (from teacher to student) but on a dialogue between teacher and student,
* not focused on interventions at certain institutionally determined decision-making moments but continued guidance,
* not only taking cognition into consideration but emotion as well, and
* not geared towards a standard-learning route but focused on the creation of more choices and the promotion of mutual participation.

## Research question and research model

However, empirical evidence is lacking that a career-oriented learning environment as defined above, will enhance the development of career competencies. The research presented here aims to provide an answer to the following question:

> *Which aspects of the learning environment show evidence of a relationship with the nature of and the degree to which career competencies are used by students?*

Besides the characteristics of the learning environment previously mentioned, personal variables play a role in whether career competencies are learned. Firstly, the degree to which students develop a career depends on their gender. Boys and girls seem to have more career interest and a higher degree of independence in work in career areas where they believe more of their own genders are employed (Ji, Lapan & Tate, 2004). From research done by Patton, Bartrum and Creed (2004), it became clear that girls score higher on competence with regards to making career choices than boys, however male students turned out to be more sure of their career choices. Age is also related to career choice and competence: the older the students are, the better they prepare for career choices (Creed, Prideaux & Patton, 2005) and the more sure they are about their careers (Rowland, 2004). Patton, Bartrum, and Creed (2004) show that an internal locus of control contributes to the career planning, self-knowledge, knowledge of the work attitude, and better career choices. Rotter (1966) uses the concept "locus of control" to express how people perceive the connection between their own action and the outcomes that result. If a person attributes their success or failure to their own actions, one speaks of an internal locus of control.

The variables that have been taken into consideration and the relationships that have been analyzed in this study are shown in the model in Fig. 1.

We have formulated three hypotheses:

1. A career-related program organization that is practice- and inquiry-based advances the use of career competencies by students.
2. Career dialogue contributes more to the use of career competencies by students than traditional career guidance (i.e., tests, counseling for dropout prevention, and incidental individual conversations with a school career counselor).
3. Career dialogue contributes more to the use of career competencies by students than personal factors.

## Method

*Sample*

The study sample is drawn from Pre-Vocational Educational (PVE) and Secondary Vocational Education (SVE) students in their third and fourth year of middle/high school. SVE schools fall into two subcategories, with an emphasis on either Practical (SVE-P)
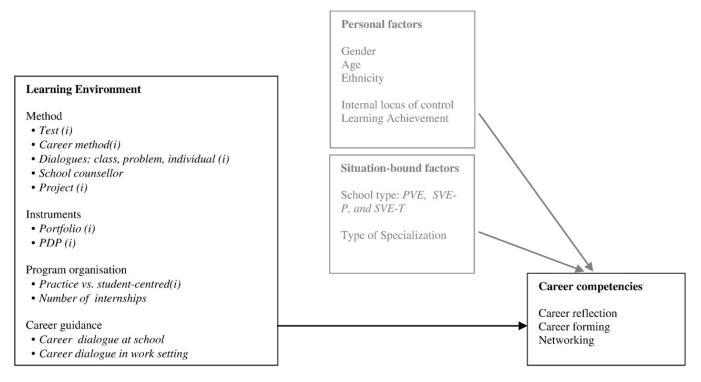
**Fig. 1.** Research model.

or Theoretical (SVE-T) training.[1] This sample was drawn via a multistage process. In the first stage, all 342 PVE and all 18 SVE vocational schools in The Netherlands were invited to a conference concerning career guidance and counseling, organized by Het Platform Beta Techniek (a nongovernmental organization aiming at stimulating enrollment in scientific and technical education) and Het Platform Beroepsonderwijs (a nongovernmental organization aiming at innovations in vocational education) in fall 2006. Both organizations are heavily subsidized by the Department of Education. Representatives of the attending schools were approached by the researchers and asked whether they would like to participate in the present study. Teachers—and their students—were then selected by each positively responding school and were asked to participate. Participating schools were spread throughout The Netherlands and covered inner city as well as rural regions. There are no significant differences between participating schools and nonparticipating schools with respect to size, school population (especially with respect to gender and ethnicity), and environment (urban vs. rural). However, participating schools are likely more positive towards career guidance and counseling than non-participating schools.

*Construction of instruments*

The instrument used for collecting data from the students, a self-evaluation-based questionnaire of 88 items, was developed in five phases. First, an analysis was made of existing questionnaires in the area of career development and especially career competencies in education. Because no existing instrument was found that was truly applicable for this study, the questionnaire of Kuijpers and Scheerens (2006) and Kuijpers, Schyns, and Scheerens (2006) became the foundation of the instrument used here to measure career competencies. Secondly, initial, qualitative interviews were conducted with students, teachers, and career counsellors in PVE and SVE schools to operationalize relevant variables. In these interviews, specific career orientation methods and career-related instruments, which are used within PVE and SVE schools, were identified. Based on this study, additional items were formulated. Thirdly, a pilot questionnaire, based on the previous two phases, was presented to 18 students by way of interviews. Each individual item of this pilot questionnaire was discussed with each student. The questionnaire was consequently amended and then evaluated by a language expert and a methodologist. Fourthly, the questionnaire was presented to 200 students for an examination of the psychometric performance of the items and scales, with the intention of possibly culling the

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[1] The Dutch educational system has two main tracks after primary education. Almost 60% of all students enter the vocational track, starting with prevocational education (aged 12–16), followed by secondary vocational education (aged 16–20). In secondary vocational education students can choose 2-, 3- or 4-year course programs in four separate sectors (technical, economic-administrative, services and health, and agricultural), and they may choose between full-time school-based education and a practice-based apprenticeship system. The best students can move on to higher vocational education and even end up with a university degree. The other 40% of students enter general secondary education after primary school and choose between education, leading to higher vocational and/or preuniversity education. The vocational track has less status than the general track, and especially in prevocational education, children from disadvantaged groups (i.e., traditional working class and minority groups) are overrepresented. Although these students have a formal opportunity to enter higher vocational education and even university, only 15% do so (CBS, 2009). For most children who enter prevocational education, formal education ends at age 17 (when compulsory education ends) or 18 (after finishing secondary vocational education).

number of items for the definitive questionnaire. Finally, the results of the process were presented to a board of experts in the field of career development, with a few minor changes as a result.

In addition to the instrument developed for students, a short questionnaire was developed for teachers, with the purpose of collecting data concerning the career learning environment. Items from this questionnaire were generated during qualitative study and were presented to the teachers who were asked to evaluate them. The selected items were presented to each of the students in the form of a written, self-assessment questionnaire. A second, written self-assessment questionnaire was presented to the teachers.

The questionnaire consisted of the following components:

*A. Career competencies*: The instrument used for measuring career competencies was based on a written, self-assessment questionnaire developed for the workplace (Kuijpers & Scheerens, 2006; Kuijpers, Schyns, & Scheerens, 2006). Kuijpers et al. originally distinguished five career competencies; in the present case, a three-factor model of career competencies fitted best. Capacity and motive reflection were combined in one factor 'career reflection', and work exploration and career action were combined in one factor 'career forming'. So, the three competencies measured in the present case are career reflection (characterized by reflective behavior), career forming (characterized by proactive behavior), and networking (characterized by interactive behavior). The response categories of the items vary from 1 = strongly agree to 5 = strongly disagree. Example items are as follows:

Career reflection:

• To find out what I really consider important in life, I talk to my parents or caregivers.
• I sometimes think about the things in my life that I have been good at.

Career forming:

• I arrange guidance that I think I need myself.
• I do extra things in my training, so that I have more chance at getting interesting/enjoyable work.

Networking:

• I talk to skilled people about my future plans.

*B. Career methods and instruments*: Frequently used career orientation methods in vocational education are the use of career choice tests, the use of curriculum methods in the form of written material geared towards career orientation, career talks (one-on-one with each student, but only with students who threaten to drop out, or with the whole class) and engaging a career counselor. In addition, two innovative instruments in the area of career counseling are presently in use: the Personal Development Plan (PDP) and the Portfolio (PF) (Mittendorff et al., 2008; Mittendorff, 2010). Via the questionnaire, teachers were asked which of these methods are used as part of the Career Orientation and Guidance (COG) program with the group of students that participated in the study. Teachers were also asked whether use was made of the PF and a PDP for students and—if this was the case—how this career instrument was used: for studies within the school (school progress), to make the transition to future education, for career planning, or with a focus on the life plan. As the latter three uses rarely take place (only 0.7% to 6.6% of the students use the PDP or PF to focus on future education, career planning, or life plan), groups in the analysis were divided into groups that do and do not make use the PF and a PDP.

*C. Career-oriented program organization*: The degree to which a program's organization was student-centered and practice-based was evaluated by the teachers themselves. The response categories of each of the six items used went from 1 to 5: from a barely career-orientated program organization (in which course offerings and in-school learning takes a central place) to a more career-orientated program organization (in which students have the opportunity to make choices and get practical experience). Example item: To what degree does the program of these students offer a chance to learn in career practice? A 5-point Likert-type scale was to respond with answer categories such as, "Training takes place at school" to "Training takes place on the job." In addition, students were asked how many internships or work placements they had done.

*D. Career-oriented guidance*: Students were asked questions concerning the degree to which a career dialogue took place at school and in the workplace. Six items were used for each of the two scales. Examples of items were: "Teachers ask me what I want to learn," "Teachers ask me why I want to learn that," "In discussion the teacher/mentor helps me to discover what my future wishes are," and "During my internship I talk to my mentor about what kind of work fits me." A 5-point scale for responses was used with response categories, such as: "Teachers never ask me what I want to learn" to "Teachers ask me very often what I want to learn." In addition, students were asked if they had had one or more discussions with a guidance or career counselor.

*E. Personal- and situation-bound factors*: Various situational and personal student variables were included in the questionnaire. Situational variables were school-type (PVE, SVE-P, and SVE-T) and the type of program that students were enrolled in. The programs were divided into the following groups: technical studies, economics, agriculture, healthcare, PVE-theoretical, and "other." Personal variables were gender, age, internal locus-of-control, and study achievements. Internal locus of control was measured by three items (an adaptation of the original items of Rotter (1966) by Den Hertog (1992). Achievements were used as indicators of cognitive abilities based on the assumption that the degree to which individuals develop competencies might be partly dependent upon their cognitive abilities (Van Merriënboer & De Croock, 2002). Students were therefore asked to respond to the statement: "In the past 3 months, I received only passing grades."

*Statistical analyses*

To investigate the extent to which a career-oriented learning environment contributes to the development of career competencies for students in PVE and SVE, regression analyses were carried out. The three career competency scales were used as dependent variables and the variables describing the learning environment were used as independent variables. Individual and situational characteristics (gender, age, locus of control, study results, and school-type, and program-type) were included as potential confounders. The total amount of explained variance was examined, and a block-wise regression was also employed to establish the contribution (to the explained variance) of the learning environment characteristics in addition to the subject and situational characteristics. Because of the hierarchical nature of the data (students within classes within schools), multilevel regression was conducted, using the MLWIN v.2.0 program (Rasbash et al., 2005). All continuous variables were normalized to a mean of zero and a standard deviation of 1.0. All hypotheses were tested two-sided and *p*-values less than 0.05 were considered to be significant, unless indicated otherwise.

## Results

*Sample accrual*

Seventy-eight (23%) of the 342 PVEs and 18 (100%) of the 18 SVEs in The Netherlands attended the conference. Of those attending, 18 of the PVEs (23%) and 17 of the SVEs (94%) responded positively. The management of these schools made the decision as to which classes would participate in this study. No information is available concerning how the management made these selections. A total of 3499 students and 166 teachers from 198 classes in those 35 schools participated in the study. Since much of the information concerning the learning environment—the primary point of interest for this study–was derived from the teachers of these students, a partially or nonresponding teacher could cause missing data for all or most of the students in his/her class. Data from 13% of the responding students were lost in this manner.

*Sample characteristics*

Student characteristics, characteristics of their school, and characteristics of their learning environment are displayed in Table 1. Slightly more than half of the responding students were male, and approximately 10% considered themselves to be members of a minority group. Their average age was 18 years; this variable is also skewed as a number of students being older than 40 years. Almost 1/3 of the students specialized in health care, and almost 2/3 attended secondary vocational education (SVE). Approximately 50% of the students had a counselor, approximately 40% utilize a portfolio (PS), and almost 1/3 had individual discussion(s). Only 20% had a PDP.

All multi-item scales had an adequate Cronbach's alpha (i.e., >0.70), with the exception of the three-item Locus of Control Scale, which only had an alpha equal to 0.62.

*Regressions*

The regression coefficients and standards errors for the multilevel regressions for each of the three independent variables are shown in Table 2. The percentage of explained variance for the three dependent variables varies between 19% (career networking) and almost 30% (career forming), which may be characterized as having a medium to large effect size (Cohen, 1988). The amount of variance due to differences between schools and between classes is negligible, although the class variance is statistically significant. The additional variance is due to the total effect of all learning environment variables, in addition to student and school variables, varies from 7% to 11% for the three outcome variables. The corresponding effect sizes may be characterized as small to moderate.

*Career learning environment*

The results show that different aspects of the learning environment explain the variance on the scores of career competencies. Problem-based discussions are significantly beneficial for all three outcomes, with small to moderate effect sizes. In other words, talking with students who tend to drop out, contributes to reflection, action, and interaction of students concerning their career. Despite what one would expect, there is no evidence that career tests contribute to students' career development. Other instruments, such as portfolios (PF) and personal development plans (PDP) seem to have no impact on the career development of students, except for PDP in career forming. Students who make use of a PDP report taking more action in directing their careers than students who do not use a PDP. School methods for career development relate to career reflection but do not contribute to career forming or networking by students. Furthermore, the results seem to indicate that the form of discussion (class or individual), as well as the role of the person that leads the conversation (student counselor) does not significantly impact the outcome on career competencies. However, the content of the conversation (especially when it deals with career issues), does appear to contribute to the scores of career competencies. Career dialogues—either in school or on the job—are significantly beneficial for all three outcome variables, with moderate effect sizes. The hypothesis that a career dialogue contributes more than traditional career guidance is confirmed, except for problem discussion. The hypothesis that practice-based learning contributes to

**Table 1**
Learning environment, personal, and situational characteristics ($n = 3499$).

| Learning environment characteristics | N | % | % missing | Cronbach's alpha | Number items |
|---|---|---|---|---|---|
| Methods used [a] | | | | | |
|   Test | 225 | 6.4 | 13.1 | – | – |
|   Career method | 542 | 15.5 | 13.1 | – | – |
|   Class discussion | 325 | 9.3 | 13.1 | – | – |
|   Problem discussion | 792 | 22.6 | 13.1 | – | – |
|   Individual discussion | 1127 | 32.3 | 13.1 | – | – |
| Student counselor | 1780 | 50.9 | 0.8 | – | – |
| Project [a] | 117 | 5.1 | 11.0 | – | – |
| PF [a] | 1326 | 37.9 | 11.5 | – | – |
| PDP [a] | 718 | 20.5 | 11.5 | – | – |
| | Mean | SD | | | |
| Program organization [a] | 2.5 | .8 | 11.0 | .76 | 6 |
| Internships | 1.8 | 1.1 | 0.0 | – | – |
| Career dialogue at school | 2.6 | .8 | 0.7 | .83 | 6 |
| Career dialogue on the job | 3.5 | .8 | 6.3 | .88 | 6 |
| Student characteristics | N | % | | | |
| Gender | | | | | |
|   Male | 1931 | 55.2 | 2.9 | – | – |
| Ethnicity | | | | | |
|   Minority group | 376 | 10.7 | 5.4 | – | – |
| | Mean | SD | | | |
| Age | 18.5 | 4.6 | 7.8 | – | – |
| Internal locus of control | 2.2 | 1.3 | 0.1 | .62 | 3 |
| Learning achievement | 3.2 | 1.3 | 1.1 | – | – |
| Situational characteristics | N | % | | | |
| School type: | | | | | |
|   PVE | 1280 | 36.6 | 0.0 | – | |
|   SVE-P | 489 | 14.0 | 0.0 | – | |
|   SVE-T | 1697 | 48.5 | 0.0 | – | |
|   Other/unknown | 33 | 0.1 | 0.0 | | |
| Specialization: | | | | | |
|   Technical | 530 | 15.1 | 0.0 | – | – |
|   Healthcare | 1040 | 29.7 | 0.0 | – | – |
|   Economy | 595 | 17.0 | 0.0 | – | – |
|   Agriculture | 314 | 9.0 | 0.0 | – | – |
|   PVE-theoretical | 495 | 14.1 | 0.0 | – | – |
|   Other | 525 | 15.0 | 0.0 | – | – |
| Outcome measures | Mean | SD | | Cronbach's alpha | Number of items |
|   Career reflection | 3.4 | 0.6 | 1.0 | 0.82 | 11 |
|   Career forming | 3.1 | 0.7 | 0.4 | 0.84 | 14 |
|   Career networking | 3.0 | 0.6 | 0.0 | 0.82 | 7 |

[a] Measured by instructor.

career development is confirmed based on the outcomes of Internships on career forming and career networking. However, we find no evidence for our hypothesis that a career-related program organization that is practice- as well as inquiry-based advances career development in students.

Looking at the results per career competency, we see that career reflection is mainly promoted by a school-based method of career reflection, by problem discussions, and by career dialogues in school and practice. Career forming takes place with the use of personal development plans. Both career forming and career networking occur in a learning environment where problem discussions, internships, and career dialogues in school and practice take place.

*Situational and personal factors related to career competencies*

The mean scores for students are not significantly different between the various specializations. However, the students in the SVE-T schools (with respect to those in PVE) have sizeable and significantly larger means for all three dependent variables, as do SVE-P (with respect to PVE) for career reflection. So, we see that career reflection happens mostly in secondary vocation education, more than in prevocational education. Career forming and networking occur mostly in the theoretical route of secondary vocational education.

With regard to personal factors, higher scores for Locus of Control are positively—and significantly—related to all three outcome measures. Ethnicity and learning achievement are significantly related to two out of the three outcome measures, while age and gender are each significantly related to one outcome measure. To compensate for the outcomes on career competencies with respect to personal factors, aspects of the career learning environment, with similar effect sizes, might be implemented. For example, boys prove to be more active in networking. To compensate this for girls, girls need to have career dialogues in practice. Younger students and students with low level of learning achievement tend to perform less well in career forming. This might be

**Table 2**
Results of multilevel regression analyses with career competencies as dependent variables.

| | Career reflection | Career forming | Career networking |
|---|---|---|---|
| Method (w.r.t. none)[a,b] | | | |
|   Test | −.051 (.111) | −.076 (.110) | −.099 (.109) |
|   Career method | .291 (.116)[*] | .102 (.115) | .164 (.113) |
|   Class discussion | .107 (.116) | .221 (.117) | .219 (.115) |
|   Problem discussion | .298 (.102)[*] | .227 (.104)[*] | .265 (.103)[*] |
|   Individual discussion | .133 (.102) | .147 (.104) | .150 (.102) |
| Student counselor (w.r.t. none)[b] | .032 (.032) | .036 (.038) | .013 (.040) |
| Project (w.r.t. none)[a,b] | .131 (.151) | .069 (.148) | .078 (.145) |
| Instruments (w.r.t. none)[a,b] | | | |
|   PF | −.035 (.062) | −.113 (.061) | −.056 (.060) |
|   PDP | .165 (.085) | .201 (.086)[*] | .114 (.084) |
| Program organization [a] | −.036 (.032) | −.043 (.032) | −.040 (.032) |
| Internships | .042 (.022) | .081 (.021)[*] | .072 (.023)[*] |
| Career dialogue | | | |
|   School | .121 (.021)[*] | .286 (.018)[*] | .186 (.021)[*] |
|   Practice | .172 (.020)[*] | .123 (.020)[*] | .205 (.021)[*] |
| Gender (boy w.r.t. girl)[b] | −.080 (.047) | .060 (.042) | .209 (.048)[*] |
| Age | .041 (.025) | .085 (.025)[*] | .035 (.026) |
| Ethnicity (non-Dutch w.r.t. Dutch)[b] | .153 (.063)[*] | .205 (.061)[*] | .023 (.064) |
| Internal locus of control | .161 (.019)[*] | .155 (.018)[*] | .108 (.019)[*] |
| Learning achievement | .030 (.019) | .095 (.018)[*] | .056 (.019)[*] |
| SVE-P (w.r.t. PVE)[b] | .364 (.080)[*] | −.021 (.076) | .143 (.076) |
| SVE-T (w.r.t. PVE)[b] | .549 (.111)[*] | .333 (.105)[*] | .433 (.106)[*] |
| Technical (w.r.t. "rest")[b] | −.106 (.086) | −.156 (.084) | −.036 (.082) |
| Economics (w.r.t. "rest")[b] | .019 (.085) | .067 (.083) | .012 (.081) |
| Agriculture (w.r.t. "rest")[b] | −.146 (.130) | .080 (.110) | .100 (.108) |
| Health care (w.r.t. "rest")[b] | .019 (.081) | −.104 (.076) | −.011 (.076) |
| School variance | .006 (.006) | .000 (.000) | .000 (.000) |
| Class variance | .030 (.010)[*] | .038 (.010)[*] | .028 (.009)[*] |
| Total explained variance | 24.3% | 29.9% | 19.9% |
| Explained variance due to learning environment characteristics in addition to student and situational characteristics | 6.8% | 11.1% | 8.4% |

$N = 2427$, 2440, and 2436. All continuous variables were transformed to Z-scores. Regression coefficients are shown, with the standard errors between parentheses.

[*] $p < 0.05$.
[a] Evaluated by the instructor.
[b] Categorical variable.

compensated for by offering them an internship. Students with a lower internal locus of control might have more career dialogues at school.

The hypothesis that career dialogue explains more of the scores on career competencies than personal factors is for a large part confirmed by the results.

## Discussion

In educational career guidance, traditionally a person–environment approach dominates, in which knowledge about person and environment for the most part is not based on real-life experiences with work but is created by instruments and professionals and transmitted by standardized methods that are not aimed at the creation of personal meaning via dialogue. This study shows that a traditional approach does not support the use of career competencies. A learning environment, however, that stimulates real-life experiences with work and a dialogue about these experiences does contribute to the use of career competencies. Even when personality traits of the student and their education are taken into consideration, we see that the characteristics of the learning environment influence the degree to which and the kind of career competencies learned and used by students. In particular, the career dialogue and the conversation students have in the workplace prove to be crucial. Both contribute to career reflection, career forming, and networking; in fact, this dialogue is more strongly correlated with the development of career competencies than personality traits are.

In groups in which a career method or a personal development plan (PDP) is used, students report reflecting more on their careers. Also in groups in which students who threaten to drop out are engaged in a dialogue, more reflection takes place. This does not mean, however, that these students give more direction (career forming) to their careers. At the moment, it seems only reflection increases. The more traditional forms of career guidance, such as conversation with the guidance counselor and career guidance tests, do not noticeably encourage students to use career competencies.

To encourage students to become more self-directed in their careers, it is advisable to allow students to make their own choices about what they want to learn, and ask them to articulate why they want to learn those things. Concrete experiences in the

workplace and assignments can be used at school to promote reflection among students and to help them orient themselves in regards to their career futures. These conversations are crucial in helping students to apply career competencies.

A hypothesis of this study is that a strong learning environment not only allows a student to engage in a dialogue with mentors/teachers about his or her career both at school and in the workplace, but that it must be practice-based, too. That means that students get the chance to engage in numerous and varied hands-on work experiences. If practice-based learning is operationalized to reflect the number of work placements a student has had, then it shows that practice-based learning does in fact encourage students to use career competencies. Students who do more work placements report that they give more direction to their careers and that they network more frequently. However, they do not reflect more on their careers than those who do not do work placements. To achieve reflection, a dialogue at school or in the workplace must be set up. In other words, to make use of career competences, it seems the organization of the curriculum or the use of certain methods and techniques is not important, but rather the engagement in and the achievement of a career dialogue.

However, to achieve an actual career dialogue in the current education system has proven to be very difficult. Quinn (1991) showed that in organizations that remain stable over a long period of time, a culture develops that is attractive to personality types who value output, control, and management. Education has barely changed between 1920 and 1980; everything was focused on the efficient transfer of established knowledge in the form of an established curriculum. The teacher was the central figure who was seen to be enthusiastically transferring knowledge to students from his or her precise and well-defined area of expertise. Recent studies by Mittendorff et al. (2008), Mittendorff (2010), and Winters et al. (2009) show that the monologue is the norm in the classroom: teachers, even in guidance contexts, rarely speak to students but mostly to and about them. The question then is how can 'unwilling' professionals be encouraged to work in new professional directions? Recent research by Hensel (2010) about the development of personality traits among professionals shows that the same learning environment that fosters the development of career competencies is required in this context. The starting point is to look at actual practical problems and to engage in a group dialogue about these (see also Collinson, Cook, & Conley, 2006; Fenwick, 2008; Garavan & McCarthy, 2008; Rowe, 2008). Constructing and attributing meaning when engaging in these dialogues is of central importance; the development of personality traits and qualities only takes place when those learning find the content meaningful (and that is something quite different than content being considered 'necessary'). The kind of dialogue that is needed here is described by Shotter (1993, p. 20), "a socially constructed myriad of spontaneous, responsive, practical, unselfconscious, but contested interactions," a form that stands directly opposed to "the apparent representation of dialogue as converging upon a single ultimate 'Truth'." Such a dialogue does not, by definition or in the first place, seek consensus but assumes pluralism and even conflict (Chiva, Alegre, & Lapiedra, 2007). The togetherness that lies at the heart of collective learning is therefore not based on preestablished truths, but a rich, shared meaning created and based on the ideas of all those involved (Easterby-Smith, Crossan, & Nicolini, 2000). To achieve such a learning environment within the dominant educational culture, transformative leadership is essential (Geijsel & Meijers, 2005; Geijsel, Meijers & Wardekker, 2007). Such leadership, however, is rare in Dutch vocational education.

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