

Comparative Issues and Research Concerns
in the National Landscapes
of Vocational Education & Training

COMPARATIVE ISSUES
AND RESEARCH CONCERNS
IN THE NATIONAL
LANDSCAPES OF VOCATIONAL
EDUCATION & TRAINING

EMERGENT ISSUES IN RESEARCH
ON VOCATIONAL
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PREFACE

This book is the second volume of the series Emerging Issues in Research on Vocational Education & Training, an outcome of the international networking of the research group VETYL (*Vocational Education & Training/Yrkeskunnande och Lärande*), at the Department of Education, Stockholm University, Sweden. This research group was created in 2011 with twofold aims: contributing to the advance of knowledge in the intricate area of vocational education and training (VET) and strengthening the research bases of the teacher education program for VET that is offered at the Department of Education, Stockholm University. The Swedish term “yrkeskunnande och lärande” in the name of the research group translate as “vocational knowing” and indicates one of the major research concerns of the group.

In May 2012 the group organised the first Stockholm International Conference in VET, an academic event that until may 2018 has been organised yearly following the modality of invited papers. The conference has had two core aims: becoming a forum for sharing state of the art research in the VET field and a forum for networking and cooperation. The Stockholm International Conference in VET has now a well gained place within the major academic events organised in Europe as part of the European Network for Vocational Education and Training (VETNET). This volume is a product of the networking originated in the conference. The chapters in this volume consist of

selected and reviewed texts that were first presented as papers in the sessions of the conference held in May 2018. They are representative of the research in the field of Vocational Education & Training that is been carried out in the different institutions engaged in the above-mentioned network. The title of this volume *Comparative Issues and Research Concerns in the National Landscapes of Vocational Education & Training* serves as an umbrella where comparative analysis as well as other research outcomes of cross-national interest are presented.

In section I of this volume national typologies in VET as depicted in comparative studies are presented together with research that deepens into the particularities of VET in specific national contexts. The contribution by Matthias Pilz highlights that vocational education and training (VET) systems are structured from an international perspective in very different ways, due to varying objectives of VET embedded within the national education and labour market systems. The purposes of typologies in international comparative VET is analysed and a multi-perspective approach to developing a new typology is presented.

The developments in a national context, in this case Sweden, are presented in the contribution by Thomas Persson with focus on the Swedish Higher Vocational Education (HVE) system, its configuration, experiences and outcomes. Adding to the insight into national landscapes the chapter by Mónica Moso-Díez and Mercedes Chacón-Delgado presents a study of the variables that influence educational choices for Short Cycle Tertiary Education (ISCED 5), also called Higher Vocational Education and Training (HVET,) among young people in Spain.

Complexities of academic formation in a specific VET context are dealt with in the chapter by Mathias Götzl, Patrick Geiser,

Robert W. Jahn and Hannah Frind. The chapter analyses the academic professionalization of business education as a science in the German-speaking area in the 20th century. The study contributes to a deeper understanding of the formation and establishment of VET as a science in the German-speaking area.

Focusing on the contribution of green technology to sustainable development in terms of the environment, economy and social activities Arasinah Kamis and co-authors highlight the role of VET departing from the Malaysian educational context. They argue that green technology also needs to be integrated into the TVET curriculum to foster students that are not only technically competent, but also responsible towards the environment.

The Section II of this volume focuses on research into language and social cohesion issues. The contribution by Nina-Madeleine Peitz is part of a project that develops, tests and evaluates qualification modules in four German vocational schools. According to Peitz, German language competence levels are far too low within the group of young adults during their vocational training phases, having implications both on their professional future but also on personal success in life. The German Vocational Education system prepares students on their way from school to work but according to Peitz there is a challenge given by the increasing diverse backgrounds with respect to mother language and German language abilities.

Adding to a landscape of core issues in research on VET, emotional capital is in attention in the contribution by Benedicte Gendron. The chapter presents outcomes of the IDEFI-program “Emotional Capital”, designed according to a collaborative active learning approach that helps young people to

explore the opportunities open to them, and make purposeful steps towards their future by developing their emotional capital.

Questioning how can vocational learning be sustained in contingent and precarious work, Karen Evans contribution aims to draw attention to the publication of the Routledge book *How Non-Permanent Workers Learn and Develop*. Evans argue that the research underpinning the book was initiated as part of a Singapore–UK collaboration. Her contribution outlines some of the perspectives developed and makes connections with recent inquiries into casualisation of work in the UK. It reviews connections between European Union and International Labour Organisation perspectives on the growing prevalence of non-standard work and the challenges this presents in contrasting economies and societies.

Concluding the focus on social cohesion that is central in the second section of the volume, the contribution ‘Promoting equity, inclusion, and safety through a high school academy in the United States’ by Edward C. Fletcher and Victor M. Hernandez-Gantes presents findings from a research project aimed to examine the school culture of a distinguished National Academy Foundation (NAF) wall-to-wall information technology (IT) high school academy. According to Fletcher and Hernandez they were particularly interested in documenting how a small learning community promotes equity, inclusion, and safety for all students. Following a case study approach, they found that the academy had a positive school culture.

Summarising, this volume illustrates well the diversity of research in the field in a way that is not frequently available in the literature today. The contributors are scholars doing research within VET in contexts with contrasting cultural and socio-economic characteristics.

We hope that the book will fulfil the expectations of a diversity of readers including under-graduate students, in particular students in initial and in-service teacher training programs for VET, post-graduate students, and policy makers.

Finally, we would like to thank the reviewers for their useful suggestions that helped to improve the contributions presented in this book.

Our gratitude goes also to all the authors for enthusiastic support to our fruitful academic discussions, the strengthening of our institutional networking and the commitment to the advancement of knowledge in the field.

Lázaro Moreno Herrera,

Marianne Teräs

& Petros Gougoulakis

Stockholm, September 2018

TABLE OF CONTENTS

SECTION I:

NATIONAL TYPOLOGIES

Typologies to Compare Different VET Systems: Purposes
and a New Approach – p. 21

Matthias Pilz

The Swedish Higher Vocational Education System
– Construction, Experiences and Outcomes – p. 52

Thomas Persson

Higher Vocational Education and Training and the
Educational Choices Made by Young People in Spain – p. 62

Mónica Moso-Díez & Mercedes Chacón-Delgado

The Academic Professionalization of Business Education as
a Science – A Collective Biographical and Network-Analytical
Study of Discipline Formation in the German-Speaking Area
in the 20th Century – p. 99

*Mathias Götzl, Patrick Geiser, Robert W. Jahn
& Hannah Frind*

Green Technology in Development Country, Community
Awareness and the Implementation in TVET – p. 126

Arasinah Kamis, Bushra Limuna Ismail & Amaruni Alwi

SECTION II:

LANGUAGE AND SOCIAL COHESION ISSUES

Is Language in Vocational Education and Training Preparation Really the Warp and the Woof? A German Perspective – p. 155

Nina-Madeleine Peitz

What Role should Universities Play in Career Guidance for Preparing Students for Successful Studies and for Work? Case study of the IDEFI “Emotional Capital” and Guidance Program for Freshmen Students in Sciences of Education of the University Montpellier 3 in France – p. 201

Benedicte Gendron

How can Vocational Learning be Sustained in Contingent and Precarious Work? – p. 235

Karen Evans

Promoting Equity, Inclusion, and Safety Through a High School Academy in the United States – p. 265

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Section I:

Comparative Issues and Research Concerns in the National Landscapes of VET

Typologies to Compare Different VET Systems: purposes and a new approach

Matthias Pilz*

Abstract: Vocational education and training (VET) systems are structured from an international perspective in very different ways, both because different countries have different objectives for their VET systems and because VET is differently embedded within the national education and labour market systems. However, many of these typologies have weaknesses, for example in relation to the consistency of their descriptive criteria. This paper therefore explains in a first step the purposes of typologies in international comparative VET. In a second step it takes a multi-perspective approach to developing a new typology that builds on existing approaches from a range of disciplines, justifies a specific combination of these approaches, and substantially expands on them. Specifically, it combines a skill formation approach with both a stratification approach and a standardisation approach. It also explicitly acknowledges the practice of learning as a criterion. In a final step the paper gives some examples of typing VET systems.

Keywords: abstract is expected to follow the layout as presented here and authors should keep to 150 to 200 words.

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Keywords: Typologies, comparative VET, skill formation systems, standardisation and stratification & practice of learning.

1. INTRODUCTION

The structured classification of vocational education and training systems in typologies has a long tradition at an international level (Gonon, 2013). Particularly in the European context, a classification has become established concerning the various forms of training in different countries. The classification criterions focus primarily on the state's influence on VET and date back primarily to Greinert (1988; cf. also Niemeyer, 2007).

This approach distinguishes between the following models: The school model, the market model and the state-controlled market-model.

In the school model, the state assumes the task of initial vocational education and training, which is carried out by the state school system. Greinert (1988) refers to France as one possible real example of this ideal type.

In the market model, on the other hand, vocational education and training is organised largely without state influence. As a result, companies only provide training services on their own initiative. This clearly shows the focus on a use-oriented approach of qualification in this model. Great Britain is cited as a practical example for this kind of model.

The third model to be introduced is the state-controlled market model. In this model, the state involves companies in training. The government sets certain legal framework conditions in this model, such as ensuring the scope and complexity of training, which can go beyond the individual company's job-specific

concerns. However, the training companies are given a certain amount of sovereignty, such as the freedom to decide whether and how many trainees are employed and which apprentices are accepted. As an example of this model type, Germany is cited.

The illustrated typology was subject to professional criticism notwithstanding its popularity. For example, it was criticised that this is not a real typologisation, that the indicators of class formation are vague or that important parts of a VET system could not be mapped in the typology (Deißinger, 1995). Various other approaches can be found in the literature on the systematisation and classification of VET systems, but these cannot be presented here. Gonon (2013, p. 4) has presented an overview in which he analyses six common classification approaches to how different “core elements of different systems in order to gain a typology” are used. His analysis reveals how different the respective focus of the classification can be.

The general critique of typologies focuses on another aspect. Georg (2005, p. 189) as well as Frommberger and Reinisch (1999, pp. 340-343) point out that classifications of VET systems often tend to ignore the complexity and integration of VET processes into the entire education, employment and social system.

In this context, a new classification approach will be developed and presented here, which, in contrast to the previous approaches, offers a broader and yet structured access to the different forms of vocational education and training in different countries. In a next step, the vocational education and training systems of some countries will be used as an example for this approach.

However, the various functions of typologies and classifications are to be presented beforehand in order to explain the basis of legitimacy and the direction of development.

2. FUNCTION OF TYPOLOGIES

The development and application of typologies in comparative VET research is controversial (Lauterbach, 2003a, p. 527). In order to systematically approach the topic, it is therefore necessary to identify the various functions of typologies on the international VET landscape.

This is achieved through an actor approach (cf. e. g. Altrichter, Brüsemeister, & Wissinger, 2007). The functions will be determined from the perspective of the various players in the VET sector. The actors involved are: education participants, training recipients, training providers, regulators (public authorities), interest groups (trade unions, employers' associations and chambers), politicians and other social groups as well as scientists (cf. Berger & Pilz, 2010).

In the context of the needs of these actors, there are seven functional areas that however cannot be interpreted without overlapping.

2.1 STRUCTURE

Each typology is used to structure complex aspects. The structure, in turn, allows the classification of real types into exactly this structure by means of corresponding descriptive features and thus leads to a systematisation of complex phenomena. Structure and order can be developed on an abstract functional level for their own sake. Structure is important for all involved actors in VET. Structure and order also form the basis for the following functional areas.

2.2 TRANSPARENCY

Providing as clear a structure as possible increases the informational value and thus the transparency of VET systems. In contrast to the general education system in many countries, within VET the degree of complexity is high (Lauterbach & Mitter, 1998) and often leads to confusion and incomprehension among both domestic and foreign actors. Due to their reduction and abstraction, classifications can provide an initial overview of the structures and processes as well as stakeholders in a VET system.

An example of this can be seen in the situation where a foreign company opens a production facility in a foreign country and is looking for suitable specialists or wants to cooperate with educational institutions (Pilz 2016). Various country studies of national and international organisations (e. g. OECD, Cedefop, World Bank, Unesco/Unevoc) serve exactly this purpose, as well as special publications for foreign companies (e. g. iMOVE & Männicke, 2011). However, more scientific publications such as international compilations (Rauner & Maclean, 2009; Pilz, 2012) or entire series such as the International Handbook of Vocational Education and Training published by the German Federal Institute for Vocational Education and Training also fulfil this task.

At the same, skilled workers trained in a national education system and wishing to apply on international labour markets have a need to present their educational qualifications to potential employers in other countries (Lauterbach, 2003b). It is in the interest of graduates to transmit their international market value to the outside world by classifying their own educational qualifications in a typology and thus to set signals for the

quality of their qualifications and the skills they have acquired. In combination with the national qualifications frameworks, typologies of education and training systems can provide precisely these signals. In Germany, for example, the Recognition Act for educational qualifications acquired abroad is making the need to define foreign vocational training systems and the quality of qualifications awarded there increasingly important (BMBF, 2015, p. 49).

For example, the signal that training has been completed in a practice-oriented setting is of the highest interest to potential employers in other countries looking for skilled workers with practical experience.

2.3 LEGITIMACY

At national level, typologies can define the different actors into specific roles with tasks and duties within a VET system (Altrichter et al., 2007). This attribution of roles can in turn be used by the actors involved as a basis for legitimising the appropriation of power. Traditionally evolved role attributions are consolidated by referring back to typologies and carried forward into the future. In addition, typologies that focus not only on responsibilities and structures but also on interaction processes can be used to create clarity and credibility in the interaction between legitimate actors.

2.4 INSPECTION

Typologies can also have a controlling function at national level. In the development of reforms in the education system, the coherence and consistency of reform elements with the existing

education system can be evaluated before implementation. By comparing the typology with the reform element, inconsistencies and breaks can be revealed. For example, the implementation of a new training course in a country's vocational training system can be compared with the existing training culture there (Pilz, 2009). In a comparative international context, the control function can also be designed by means of typologies in such a way that attractive and interesting reform activities for another country are examined before being transferred with regard to their compatibility with the conditions in the host country and thus the possibility of transfer. Classifications also provide a preliminary interpretation of why possible initiatives are successful in a given country.

2.5 COMPARISON

The previous aspect already gives the first indications of a comparative perspective. However, while in the previous example, the focus was primarily on the government agencies responsible for designing and implementing the system, the focus here is now on a more scientific perspective. There are two different approaches:

On the one hand, typologies can be used as a starting point for research activities. Typologies often serve to select countries as objects of investigation and comparison. Either homologous countries (most similar design) should then be selected, or as different and contrasting countries as possible (most different design) should be included in the comparative study (Georg, 2005). In addition, the different criteria of typology formation can also be used as an analysis system for one's own research.

In this way, individual phenomena that are clearly accentuated and at the same time are connected to a systematic approach can be used in the research context (Pilz, 2012). On the other hand, typologies can also be the final point for research activities. Findings generated in several countries can be broadly interpreted using typologies. Depending on the design of the typology, very different approaches and dimensions can be displayed and thus the findings can be placed in a consistent comparison context (Georg, 2005). In this context, comparative findings from competence measurements (large scale assessments), for example, can then be contextualised and interpreted appropriately (BIBB, 2007, point 8).

2.6 PEDAGOGICAL FOCUS

Finally, a function in the context of concrete teaching-learning situations is discussed. It can be assumed that the type of vocational education and training system provides information on how learning can be organised and carried out (Greinert, 1995, p. 5). This is due to the fact that questions of planning, implementation and reflection on VET processes as well as the selection of learning content, media and methods in formal learning settings depend on the framework conditions under which they are implemented. Consequently, a classification into a typology can give an initial orientation as to which forms of teaching and learning can be implemented. In this context, it should be noted, for example, that a learning process aimed at a small number of performance-oriented qualifications might be set up differently from a learning process aimed at teaching a broad range of operational skills.

Especially this last point shows how important a broad focus is when modelling a typology. In particular, however, the didactic orientation, which should play a central role as a product of VET, is not or not sufficiently taken into account in the existing typologies. Therefore, a new approach is presented below.

3. A NEW APPROACH: A MULTI-PERSPECTIVE VET TYPOLOGY

We shall now present and explain our own approach. Our aim is to be critically but constructively eclectic in using the strengths of existing typologies, minimising their weaknesses, and constructively enhancing and expanding these typologies.

The approach described here focuses on VET processes in the broadest sense so that it can subsequently be used to categorise as many forms as possible of existing real VET activities in widely differing countries. The primary focus is on initial vocational education and training, which enables us also to take account of non-formal and informal training processes. Our aim is also to account for training activities right along the process chain. As a result, we focus not only on inputs but also on the process itself and on outputs – outcomes in the broader sense.

We intend to do this at all three levels of VET activity – the micro-, meso- and macro-levels. Comparative research into vocational education and training has until now focused particularly on the macro-level of training systems. Niemeyer (2007, p. 123) warns that “What is lacking, however, is the link between macro- and micro-levels and research into the interdependence of the two levels, particularly from the transnational perspective.” Consequently, this approach is innovative because it integrates all

three levels. In other words, elements of the typology are generated not only at the macro-level of a VET system – at the level of stakeholders and funding – but also at the meso-level, including elements such as the curriculum, the nature of the institutions involved, certification, and the teaching staff (Gonon, 2008, pp. 97-102). Moreover – and this is something that is almost entirely absent in existing typologies (Niemeyer, 2007) – our approach aims specifically to analyse the micro-level, the level of concrete teaching and learning. This is important because it is ultimately at this level that the product of any educational process is developed. This level therefore requires particular attention.

We would point out again here that developing a typology requires a system to be expressed in idealised terms. This means two things. First, not all the types included within a typology actually go on to correspond to real types – that is, a country and its VET system may not always be categorised as a particular (ideal) type. Second, there is a further issue relating to the ‘reach’ of any typology: as noted above, typologies can portray only the standard operation of a VET system, and are unable to accommodate discrepancies and special cases, such as full-time school-based education in Germany (Hippach-Schneider, Krause, & Woll, 2007) or company internships in Japan (Ito, 2012). Nonetheless, it is important that when real types are allocated to a typology, there is an explicit reference to the extent to which it relates to the VET system as a whole (Pilz, 2002, pp. 169-170). If this is not done, it is easy for a misunderstanding to arise and for special cases to be seen as standard cases. As a result, it is important to achieve clear transparency with regard to the national scope of any VET programmes used as the basis for allocating a specific country to an ideal type.

These general conditions now constitute the framework for designing a concrete approach. The theoretical basis rests on three models.

Firstly, we have included elements of an approach from the field of sociology (outlined above), which focuses on the constructs of “stratification” and “standardisation”. This approach was developed by Allmendinger (1989) and Kerckhoff (1995) and has been widely commended (see, for example, Descy & Tessaring, 2001; Heinz, 1999; Blossfeld, 1994). In particular, it has proved very productive and informative in international comparative research (Müller & Shavit, 1998; Shavit & Müller, 2000; Pilz & Alexander, 2011).

In this approach, stratification forms part of the macro-level and relates to issues of “tracking” and of the marked differentiation of and separation between general training courses from vocational ones (Kerckhoff, 2000, p. 453). Shavit and Müller (2000, p. 443) have related this approach explicitly to the education system and argue that “[t]he term ‘stratification’ refers to the extent and form of tracking that is pervasive in the educational system.” In their research, they then use the term “tracking” to refer to pupils’ different trajectories through the school system, a view that takes in both the distinction between general and vocational education (and the different routes taken into them) and the differentiation of hierarchical levels by access, selection and transition mechanisms (Allmendinger, 1989, p. 233).

Linked to this is the question of barriers to transition or obstacles to progression (Young & Raffé, 1998). Another relevant issue is the importance of rankings and league tables for education and training institutions, since such ranking systems not infrequently produce a form of “indirect stratification” (Pilz & Alexander,

2011). Stratification should also portray the status and image of vocational training courses within individual societies (Cedefop, 2014; Winch, 2013). To simplify, “stratification” needs to be expressed in a duopolistic sense – as either “high” or “low”. It is important to bear in mind that such characteristics are relative values. The same applies to the following assessments.

Standardisation, by contrast, forms part of the meso-level. The key question here is how the structures and processes underpinning any vocational education and training system are standardised and made subject to binding regulation (Müller & Shavit, 1998). Shavit & Müller (2000, p. 443) define standardisation as follows: “(...) the degree to which the quality of education meets the same standards nationwide. Variables such as teacher training, school budgets, curricula, and the uniformity of school-leaving examinations are relevant in measuring standardisation.”

Standardisation can be given concrete expression and structured by means of differentiating between standardisation activities on the input side, on the process side and on the output side within the VET system. Thus, certification and the accompanying rights and entitlements relate to the output side and are of particular relevance. For example, they may explain whether vocational training courses form part of an exit-based or entry-based system: where follow-on training institutions devalue certificates, this is an entry-based system. Specifically, this element focuses not only on certification but also, and in particular, on curriculum, institutions and teaching staff. Here, too, standardisation is a duopolistic construct.

Secondly, a model from the field of comparative political economy is considered and used as “collective skill formation”

(Busemeyer & Trampusch, 2012). This approach fits within the tradition of an institutional political economy (Streeck, 1992; Thelen, 2004; Culpepper & Thelen, 2008) and focusses on the interaction between political and socio-economic institutions and other stakeholders in the VET context (see also the approach taken by Crouch et al. (1999) above in relation to identities). The approach is, therefore closely linked with the popular “varieties of capitalism” approach taken by Hall and Soskice (2001).

It is interesting in this context that the origin of the collective skill formation approach refers explicitly to Greinert (see above) and to the concept of stratification (Busemeyer, 2009, pp. 384-385; Busemeyer & Trampusch, 2012, pp. 8-15). This model, too, has in the past frequently been used in the international context in a cross-disciplinary way (Busemeyer & Trampusch, 2012; Busemeyer & Schlicht-Schmälzle, 2014). The model operates primarily at the macro-level and correlates particularly with the stratification alluded to above, for example in relation to the relationship between general and vocational education. In addition to the influence of stakeholders on VET policy, the issue of direct funding and financial involvement is also of crucial importance (Busemeyer & Trampusch, 2012, p. 21). For our purposes, however, we see stratification again as a self-standing dimension in order to be able to differentiate between the depth of differing approaches to VET (see below).

The skill formation model will be taken as the starting point for developing a typology and covers four characteristics (see above). It reveals the influence of the state on vocational education and training and the potential for activity by and influence from companies. Where both influences are limited, individual influence may be prioritised as the third value (for example,

participation in individually funded training provision organised by the private sector). Where, however, state and companies have a high level of influence, this may be characterised as a mixed system. As a result, differing levels of activity produce a total of four different constellations of stakeholders that can then be illustrated in the form of a matrix. This model is not only the starting point for the entire typologisation process (because it follows on closely from Greinert's approach to VET research, for example) but also links to the stakeholder model, which is important in VET, and issues of educational governance (Robertson et al., 2012; Berger & Pilz 2010).

Thirdly, the explicitly vocational-pedagogical perspective now enters the equation. We cannot directly use existing wide-ranging approaches to typology development but need to adapt approaches from diverse areas of vocational pedagogy and teaching design. Here, the focus is specifically on the concrete relevance to vocational practice or to later roles within the employment system of the teaching and learning processes. To achieve this, we shall fruitfully make use of two established approaches from the pedagogy of vocational education and training.

First, the learning content delivered may be analysed in relation to both its theoretical and its practical content. At operational level, this would, therefore, include aspects such as the skill acquisition expected as a result of a particular learning process (e.g. the role of self- and social competences; see Brockmann et al., 2011) or the selection and structuring of the topics covered and the balance between a technical skills orientation and a situational orientation. Of particular significance here is also the question of whether, as part of vocational learning processes, curricula produce a fragmentary and poorly integrated acquisi-

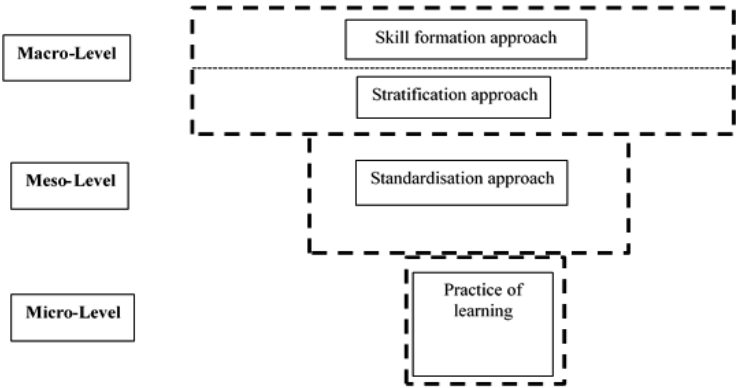
tion of skills or whether a system focuses instead on the acquisition of complete and complex performed actions in the context of situated learning (i.e. planning, implementation and review) (see, for example, Billett, 2001; Evans et al., 2006).

Second, this last point illustrates the crossover with a further approach, this time related to the kinds of teaching and learning involved and, hence, the teaching process. Heavily teacher-centred learning activities can be interpreted as substantially influenced by theory. Here, the interaction and social relationships between teachers and learners (such as teacher-centred work versus group work or receptive learning versus discovery learning), the level of freedom learners have within the learning process (self-directed learning), and the individualisation of learning processes all play a part. Furthermore, the practical relevance of the media and methods used, including such teaching and learning arrangements as case studies, is also important (see, for example, Grossman, Wilson, & Shulman, 1989). This didactic perspective shifts the focus of the analysis away from the learning location (see discussion above about Greinert's approach) and replaces it with the specific teaching and learning process and, hence, explicitly focusses on the micro-level. This helps to highlight the issues surrounding the categorisation of learning locations at the theory/practice level, since theoretical learning may well also take place in companies, while practical learning may well also take place in schools, for example, in a training workshop. On the other hand, the hypothesis of an explicit focus on the product of vocational education and training is retained. The theory includes diverse approaches to an understanding of this kind in research on workplace learning (e.g. Fuller & Unwin, 2013; Gruber, Harteis, & Rehrl, 2008;

Dehnbostel & Dybowski, 2000). In short, a duopolistic scale – “high” or “low” – is needed to assess the practical relevance of teaching and learning processes.

The four dimensions derived in this way represent a compromise. On the one hand, it would be possible to devise a system with a high number of dimensions that would enable a very accurate picture to be derived but would be too detailed to enable a clear view to be formed. On the other hand, it would be possible to focus on a single dimension, but this could lead to over-simplification or to excessive generalisation (see above). This approach therefore constitutes a compromise. A further point is that the dimensions developed are not entirely independent of each other but are interdependent. However, the ranking on the three levels clearly demonstrates the key focus of each dimension (see Figure 1).

Figure 1:
The four dimensions in the context of allocation to specific levels



To use this approach, it is appropriate to begin consideration at the macro-level and there to prioritise the skill formation approach (see above). This approach then forms the starting-point for further analysis. The reason for this is that many conditions are set at macro-level that then have further consequences at meso- and micro-level. At the same time, the skill formation approach has proved its value both in theoretical discussion about the control of VET systems and in the broader context of typologisation and cross-country comparisons (see above).

The four characteristic forms in the skill formation approach and the two rankings on the remaining three dimensions (high or low) generate a total of 32 potential combinations (Fig. 2).

Figure 2:
Dimensions and main characteristics

Skill formation mode →	Stratification →	Standardisation →	Practice of learning
State dominance	high	high	high
		low	low
	low	high	high
		low	low
Company dominance	high	high	high
		low	low
	low	high	high
		low	low
State and company dominance	high	high	high
		low	low
	low	high	high
		low	low
Individualised (low state and company activity)	high	high	high
		low	low
	low	high	high
		low	low

It would be unrealistic to assume that all these potential combinations are equally internally consistent. For example, within a VET system with a high degree of state organisation, it may be assumed that standardisation will be high. By the same token, in a system that is primarily organised by companies, it may be assumed that the level of standardisation will be low. However, as noted above, not all classes or potential combinations within a typology are borne out by real types. Nonetheless, having a wide spectrum of variants – at least in theory – creates a broad focus and does not a priori rule out any options. For example, even within a system that is strongly tailored to private initiative – that is, that has low levels of state influence and company influence – it may still be the case that there is a high level of standardisation if private sector training providers are subject to common standards and external oversight, albeit not generally from the state.

The approach propagated here also has a number of other weaknesses that need to be acknowledged. For example, it cannot provide analysis of the full diversity of VET activities or of all facets of the very different VET available across the international context. Here, too, the restriction to “standard cases” that is common to all international comparisons applies (see above), meaning that other interesting VET options, such as traditional apprenticeships in the UK or full-time vocational schools in Germany, are ignored. This limitation leaves a certain amount of leeway for interpretation of what constitutes a “standard case”. This leeway also relates to all dimensions of the approach described here and subsequent interaction with the characteristics detected for a specific country. Only intensive analysis of country specificities and explanation of the deci-

sion-making procedure that underpins rankings can begin to make such leeway transparent.

The next step is to use the dimensions we have developed to rank individual real types (that is, the VET systems of individual countries) in accordance with a typology made up of ideal types. If a large enough number of countries is taken into consideration, it will be possible to identify those elements in the typology that often, in reality, correspond with or approximate in formal terms to actual VET systems. It will then be possible to attach an appropriate classification or nomenclature to these ideal types.

4. CATEGORISING INDIVIDUAL COUNTRIES

Below, we allocate individual countries to the typology for illustrative purposes. The main aim here is to demonstrate how the categorisation works and the results that it throws up. Consequently, we shall not present each country in detail and will only outline the consequences of each assessment in the context of the dimensions used.

Within the skill formation approach, the USA is seen as having a liberal approach with a low level of state and company influence and a high level of individual influence (Busemeyer & Trampusch, 2012, pp. 12-14). Both stratification and standardisation are characterised as “low” (Müller & Shavit, 1998, p. 14). At micro-level, there is a strong practical orientation to “learning by doing” at the workplace if college courses, which tend to focus more on general training, are excluded (Zirkle & Martin, 2012) and the widespread model of skill development at the workplace is given priority (Barabasch & Rauner, 2012).

Table 1.
Categorisations for the USA

USA	Skill formation	Stratification	Standardisation	Practice of learning
	<i>Individualised (low state, low employer activity)</i>	<i>low</i>	<i>low</i>	<i>High</i>

France, by contrast, is deemed to have a VET system that is primarily state-oriented (Busemeyer & Trampusch, 2012, p. 12). Against a backdrop of strongly segmented practice between general and vocational education and training, stratification can be classified as “high” (Géhin, 2007).¹ Standardisation is also classified as “high” (Müller & Shavit, 1998, p. 14), and teaching and learning processes are strongly theoretically-oriented with a low level of relevance to practice (Brockmann, Clarke, & Winch, 2008).

Table 2.
Categorisations for France

France	Skill formation	Stratification	Standardisation	Practice of learning
	<i>State dominance</i>	<i>high</i>	<i>high</i>	<i>low</i>

1 Müller and Shavit’s slightly different assessment (1998, p. 14; medium stratification) is the result of their three-point scale; we are using a two-point scale here.

Japan’s vocational education and training system is strongly dominated by companies (Busemeyer & Trampusch, 2012, p. 12; Thelen & Kume, 1999). Stratification can be categorised as “high” if the informal elements of training, which are of importance in Japan, are given appropriate significance (Eswein, 2012; Pilz & Alexander, 2011; Kariya, 2011).² Standardisation is categorised by Müller and Shavit (1998, p. 14) as “high”, although only if the informal mechanisms are taken into account, while teaching and learning processes within companies are geared to practice (Eswein, 2012; Pilz & Alexander, 2011).

Table 3.
Categorisations for Japan

Japan	Skill formation	Stratification	Standardisation	Practice of learning
	<i>Company dominance</i>	<i>high</i>	<i>high</i>	<i>high</i>

Many studies single out Germany for its ‘dual’ training system in which the state and companies share responsibility for vocational training (Busemeyer & Trampusch, 2012, p. 12; Deißinger, 1995; Greinert, 1988). Both stratification and standardisation are categorised as “high” in Germany (Müller & Shavit, 1998, p. 14; Blossfeld, 1994), while learning processes are geared to practice or actually form part of practice (Deißinger, 1995; Blossfeld, 1994).

2 These findings diverge from those of Müller and Shavit (1998, p. 14; low stratification), who argue primarily at the formal level.

Table 4.
Categorisations for Germany

Germany	Skill formation	Stratification	Standardisation	Practice of learning
	<i>State and company dominance</i>	<i>high</i>	<i>high</i>	<i>high</i>

The dominant context in India is one of low levels of state and company influence (for a fuller account, see Mehrotra, 2014 and Agrawal, 2012). Stratification is considered “high”, in particular because of the strict separation between general and vocational training (Singh, 2012; Venkatram, 2012; Pilz & Li, 2014). By contrast, skill formation in the Indian system is dominated by informal structures and processes, with VET institutions, certificates and formal curricula playing only a minor part. As a result, standardisation is classified as “low”, and within this predominantly informal system, learning processes tend to be directly linked to practice (Singh, 2000; Venkatram, 2012).³

Table 5.
Categorisations for India

India	Skill formation	Stratification	Standardisation	Practice of learning
	<i>Individualised (low state, low employer activity)</i>	<i>high</i>	<i>low</i>	<i>high</i>

3 By contrast with informal skill formation, the formal vocational education and training system in India is less important in quantitative terms (Pilz, Gengaiyah, & Venkatram, 2015).

China can be regarded as a country with a strong state influence on vocational education and training (Pilz & Li, 2014). The clear separation of vocational training from general education and training, along with restricted scope for ‘progression’ within vocational education and training, suggest a high level of stratification (Shi, 2012). Standardisation in VET is “high”, but training is not highly geared to practice (Shi, 2012; Pilz & Li, 2014).

Table 6.
Categorisations for China

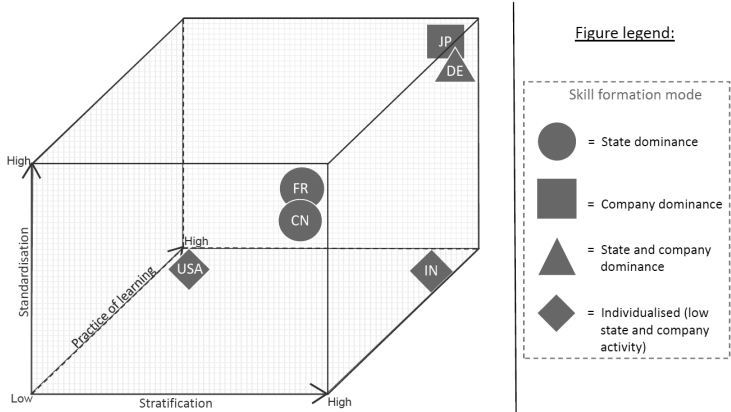
China	Skill formation	Stratification	Standardisation	Practice of learning
	<i>State dominance</i>	<i>high</i>	<i>high</i>	<i>low</i>

The classification of real types to individual dimensions and the emergence of recurring patterns of ideal types may be achieved by forming and analysing clusters. Visually, this can be illustrated in a three-dimensional graphic illustration: Figure 3 demonstrates this for the few examples discussed in the previous section.⁴ As already noted above, categorisation as “high” and “low” should be interpreted relatively. The various sub-criteria of each dimension may be weighted differently according to their country-specific importance. Moreover, we would again

4 To determine the scale and/or relevance of a particular aspect of the vocational education and training system as a whole (see discussion above), the relative number of participants in a programme can be quantified as a proportion of all participants in vocational education and training. This proportion can then be reflected in terms of the size of the relevant symbol. Thus, a large symbol may represent extensive uptake (for example, 80% to 100% of an age cohort in VET complete the relevant part of the system), while a small symbol signifies a smaller importance (below 50%, for example).

point out that categorisation does not constitute a cross-country measure and, therefore, says nothing about the relative value and quality of individual VET systems in the comparison.

Figure 3.
Categorising the findings for individual countries



Even these few illustrative country categorisations throw up some interesting findings. For example, two countries with differing skill formation modes (Japan = JP and Germany = DE) correlate to a substantial extent on all three of the remaining dimensions and, thus, across all three levels. By contrast, countries with an identical skill formation mode (USA and India = IN) diverge substantially on the stratification dimension. It is not possible here to enter into a more detailed discussion on the basis of the small number of country categorisations already carried out and the limited options for implementation: we are focussing here on illustrating how the model works rather than generating findings from the typology.

5. PERSPECTIVES

In future, it is likely that there will be interest in expanding the approach through analysing and including additional countries. The comparison involved in clustering reveals similarities and divergences that may be beneficial in a number of respects.

In connection with the transfer of VET provision from one country to another, this approach is able, for example, to provide important information on whether the planned transfer of elements of the provision will also map on to entirely different conditions at all three levels in the recipient country and whether a transfer will, as a result, be impossible or possible only with wide-ranging adaptations. A good example in this context is the transfer of Germany's 'dual' training model to countries such as the USA, China and India (Pilz, 2016; Pilz & Li 2014). The multi-level analysis shows extremely clearly that in these countries, transfer can be only partial and will closely follow national characteristics.

In summary, we would argue that an eclectic approach that incorporates the two existing and internationally tried and tested approaches creates a new and applied model. Its specific innovation lies, however, not only in the interweaving of these two approaches but also in its structuring across the three levels of vocational education and training systems and its explicit focus on the micro-level. Since this is where the practical value of teaching and learning processes is based, this model makes it possible to overcome the problems inherent in other approaches that more closely link the learning location with theory and/or practice (see above). As a result, the new approach enables VET systems to be analysed and categorised much more accu-

rately: such analysis and categorisation includes aspects relating to political economy, sociology and pedagogy in one consistent, overall approach. For example, the approach helps to make certification transparent across national boundaries (the meso-level; see above) in exactly the same way as it takes consideration of aspects of the control and influence of training policy, for example with regard to issues of supranational comparison or the transferability of control processes in VET systems. And, of course, it enables the central level of teaching and learning to form the central focus, because ultimately, it is at this level that the central activities of vocational learning and, hence, the acquisition of competencies actually take place.

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The Swedish Higher Vocational Education System – Construction, Experiences and Outcomes

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Abstract: The Swedish Higher Vocational Education (HVE) system –running since 2009 – is constructed after discussions between the National labour market organisations and the Government. At the local level there is a Provider who runs an HVE programme. The content of the programme is identified by representatives from interested Employers in Private Companies or Public Sector Organisations. The Provider and the Employers then submit an application to the Agency in order to get a permission to start and receive public financing. After processing the application, the Agency either decides to permit 1–5 cohorts/sessions to start per programme, or decides to deny permission. The annual HVE budget normally allows for 25–30% of the applications to be approved by the Agency. The Employers contribute to the financing of running the programme. The Provider appoints a steering committee which consists of a majority of employer representatives. The Agency assesses the ongoing programmes in two different ways: A formal inspection in order to judge if the Providers follow the legislation and a Quality Assurance Audit to assess the quality of the programme. The Agency also pro-

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duces statistics about the programmes and the system, and carries out evaluations about different parts of the system. The rate of employed graduates within a year after finishing a programme is currently at 93%. The rate has increased from approx. 80%.

Keywords: Higher vocational education (HVE) system, Sweden

1. INTRODUCTION

The operations of the Swedish National Agency for Higher Vocational Education are subject to instructions from the Swedish Government. The Government's annual appropriation direction stipulates the direct government funding allocated to the Agency as well as the targets to be reached, specific tasks to be undertaken and how the results of activities must be reported. There is a specific law and an ordinance regulating the Agency's operations and of providers of HVE.

In this paper we present the Swedish HVE system. The paper is a combination of describing the regulations and the roles of the system actors/players as well as a short presentation of what we know so far about the system and its outcomes and effects.

2. THE SWEDISH HVE SYSTEM

PRINCIPAL MISSION AND TASKS – THE AGENCY

The Swedish National Agency for Higher Vocational Education (NA-HVE) is responsible for matters regarding HVE programmes. The principal mission as a central authority is to analyse the demand for qualified workforce in the labour market, decide which programmes are to be provided as higher voca-

tional education and allocate public funding to education providers. The Agency assesses the ongoing programmes in two different ways: A formal inspection in order to judge if the Providers follow the legislation or not and a Quality Assurance Audit to assess the quality of the programme. The Agency also produces statistics about the programmes and the system, and carries out evaluations about different parts of the system.

In addition, the Agency for HVE administrates post-secondary Arts and Culture Courses as well as Interpretation courses and programmes. The Agency also coordinates validation of professional skills and serves as the National Coordination Point for the EQF – the European Qualifications Framework.

HVE AND THE EDUCATION SYSTEM IN SWEDEN

The HVE is one out of two main post-secondary/tertiary school systems in Sweden. The other is the Higher Education (HE) system. There are some other post-secondary alternatives, which will not be focused on in this paper. There are many vocational/professional programmes in HE such as teaching, nursing and engineering. The basic difference between HVE and HE is the overall purpose, the strength of the scientific basis and the length of the programmes.

The HVE system has been running since 2009. At that time it replaced a system for Advanced Vocational Education and Training, which had been running since 2002. In the 90's there was an experimentation period in this area.

The main objective for HVE is to supply the labour market with qualified labour. HVE integrates workplace learning and school based learning. Programmes are offered in specific

fields where there is an explicit demand for competence. HVE is delivered in cooperation between education providers and those employers in private and public organisations affected by the programme. All programmes therefore have a strong emphasis on workplace learning, normally as several periods.

The Agency makes estimations about the needs of HVE competence in different sectors (private and public) of the labour market. The estimations are derived from forecasts made from public agencies, national trade associations and regional institutions, as well as strategic decisions from the Parliament and the Government concerning labour market and business.

THE HVE SYSTEM

There are four main actors in HVE: Employers in companies and/or public organisations, the Providers, the Students and the Agency. National Trade Associations and National organisations for employers and employees also play important, but indirect, roles in the HVE system.

The Employers play a significant role in the planning of an HVE programme. They identify a need for competence in the labour market. They choose a Provider to cooperate with and together, they start planning the HVE programme. In that process they discuss overall goals, profession(s) after the programme, curriculum and syllabi, as well as appropriate eligibility requirements.

The Provider applies to the Agency in order to get a permission to start the programme and to receive state grants. The Providers may be private companies and organisations, municipalities, regional institutions and HE institutions.

The Agency decides, normally once a year, which programmes will run for the coming years (1–5 cohorts/sessions start, then re-application follows) and the size of the state grant. The selection among the applications from the Providers is made mostly on the basis of how strong the needs of the competence is in the labour market, how strong the activity and engagement is from the local employers and industry, as well as (if applicable) earlier results and outcomes. In a normal year, 25–30% of the applications will be approved.

The Provider, who is responsible for the running of the programme, appoints a Steering Committee with a majority of representatives from the local employers in the appropriate labour market sector. The Students are represented in the Steering Committee. The teaching staff might be Vocational teachers or skilled individuals from the Companies/Public organisations.

A HVE programme normally runs between 1,5 to 2 years. Time spent in work placement (LIA) must be at least 25 per cent of total programme hours. The programme must also comprise an independent work project.

The Employers contribute to and influence the programme content by taking part as lecturers, joining in projects, welcoming study visits and by offering work placements.

There are two levels of qualifications achieved upon graduation: *Diploma in Higher Vocational Education*: at least one year of full-time studies and learning outcomes on EQF5 and *Advanced Diploma in Higher Vocational Education*: at least two years of full-time studies and learning outcomes on EQF6.

HVE programmes require a completed upper secondary education upon entry. Many of the programmes also require specific entry qualifications and professional experience. An education

provider may also declare an applicant eligible for entry to an HVE programme after a so-called open assessment of qualifications. The applicant has then been judged capable enough to fulfil the requirements of the programme and to practise the profession for which the programme prepares, despite not fulfilling the general entry requirements and/or special entry requirements.

The Students are qualified for student financial aid during the entire study period.

The education providers are not governed by regional or local authorities, except when a local authority is the actual education provider. Local authorities and regions are natural stakeholders, as they are responsible for regional development. Education and supplying competence are two central aspects of their ambition for a sustainable regional and local development.

FUNDING OF HVE PROGRAMMES

HVE programmes are partially financed through public funding and partially by employers. The Agency receives an annual government grant which is allocated to education providers with ongoing programmes or to those who are starting new programmes.

The allocations to the Providers are based on the type of Programme and the number of students. The annual state grant varies from SEK54.000 (\$6.000, €5.400) to SEK81.000 (€8.100) per student. Approx. 50% of the programmes will receive SEK54.000. There are also a few exceptions for special programmes, for example pilots, where the grant is higher. The average grant per year and student is approx. SEK64.000, €6.400.

Partner funding from the Employers varies. In areas such as mechatronics it is considerable, but in other areas it only contains costs of the Employer connected to the workplace courses in the programme. It is not possible to give exact figures, but the Agency's estimation is that partner funding is 25–35% of the total costs of the Programme.

ASSESSMENT AND EVALUATION

The Agency follows up, inspects and audits the quality of the programmes. The follow up work comprises student and provider numbers/volumes, student outcomes, employment rates after graduation etc.

Staff from the Agency visit Providers and programmes in order to audit the quality of a programme. The audit follows public criteria and indicators, and is based on document studies, statistics, observations and interviews with representatives from the students, the provider and the Steering Committee. The audit ends with a decision about the Agency's judgment on the quality of the programme. The preliminary judgment is discussed with the Provider before the decision is made. The decision comprises recommendations according to the criteria and an overall judgement of the quality of the Programme (scale: 1–4). The criteria and indicators form, in the Agency's opinion, a very high performing standard.

The Agency also conducts more formal inspections, in order to judge if the Provider follows the regulations or not. There are inspections conducted on a regular basis, but most of the inspections are carried out after some kind of "alert" (mostly notifications from students or other stakeholders, or identified

shortcomings in administration). In some cases, however seldom, an ongoing audit will be interrupted and an inspection will take its place.

3. RESEARCH AND OUTCOMES

RESEARCH ON HVE IN SWEDEN

There are, so far, few scientific reports about the function of HVE in Sweden.

One of them is a study of effects on HVE students after their studies. (establishment in the labour market, salaries, employment/unemployment rates).⁵

Another is a study of to what extent students from HVE influence the productivity in industrial companies, compared to upper secondary and HE.⁶

OUTCOMES, SOME EXAMPLES

There are, however, quite a few statistical reports, most of them from the Agency.⁷ In these reports it is possible to follow and analyse for example number of students, graduation rates, employment rates and matching rates. Most of the numbers about volumes (students, economy) are collected from the providers in routines connected to reporting students results and to allocation of grants. Most of the data regarding employment and matching rates comes from surveys collected from graduated students within a year after finishing their studies.

5 Lind & Westerberg, 2015

6 Herrström, Malm Lindberg & Persson, 201

7 Reports in Swedish are published at <https://www.myh.se/Publikationer/>

At the same place there are annual reports from Quality Assurance Audits and Inspections, as well as other studies made by the Agency. The latest study is an interview and survey study. It shows the opinion of representatives from the local working life concerning their respectively HVE programme and the competence that graduated students can offer to companies/organisations.

At the website of the Agency there is a “self-service database” where it is possible to follow different data about students and programmes over the years.⁸ It is also possible to make own statistical analysis.

Here are some examples from the statistics presented by the Agency:

- Graduation rate: 73%
- Employment rate after graduation: 93%
- Employment rate before HVE programme: 66%
- Matching rate (job compared to programme content): 68–91%
- Employed at any of work placement companies/organisations: 52%”
- New employer after graduation: 85%
- Any post-secondary education before HVE programme: 34%
- Average starting age: 31,4.

8 <https://www.myh.se/Statistik/Yrkeshogskoleutbildningar/>

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Higher Vocational Education and Training and the Educational Choices made by Young People in Spain

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& Mercedes Chacón-Delgado

Abstract: The goal of this article is to conduct a study of the variables that influence educational choices for Short Cycle Tertiary Education (ISCED 5), also called Higher Vocational Education and Training (HVET) among young people in Spain. On the basis of the Spanish education system, the analysis focuses on young people aged, 16–19, studying upper secondary general (*Baccalaureate*) or vocational studies (Intermediate VET) (ISCED 3). Through a survey of 10,743 students, information about them is collected and analysed from a systemic multi-factorial approach. Its findings suggest that 21% of the sample would like to study Higher VET and decisive factors are individual and socio-economic, highlighting the level of academic performance and parents' level of education respectively. Results vary according to whether students come from upper secondary general or vocational backgrounds. The contribution this research makes to the field lies in its novel approach in Spain and in the quantitative scale of the sample. Nevertheless, we are

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aware that the research has its limitations and that it is necessary to continue study in this relevant scientific field.

Keywords: Initial Vocational Education and Training, Vocational Choices, Short-Cycle Tertiary education (ISCED 5)

1. INTRODUCTION

In today's knowledge society, education plays a crucial role in the transfer of scientific and technological knowledge and analytical and professional skills. The development of a knowledge- and innovationbased economy is one of the key drivers of growth identified by the European Union as a means of recovering from the financial crisis and preparing Europe's economies for the coming decade (COM, 2010). Among other objectives, the EU's Europe 2020 Strategy aims to reduce the early school-leaving rate to less than 10% and to ensure that at least 40% of people aged 30–34 hold tertiary qualifications. Spain in particular must reduce its early school-leaving rate, which at 30% is one of the highest in Europe, and encourage young people to enter higher education, taking either a higher vocational education and training (HIVET⁹/ISCED 5) qualification or a university degree, both of which fall within the definition of tertiary education (European Commission, 2017).

Moreover, several papers (Cedefop, 2018; Navarro, 2017, etc.) highlight the gap between the vocational profiles demanded by

9 It is also called 'Shorth cycle tertiary education' (ISCED 5). In this article the term Higher Vocational Education and Training (HIVET) will be used.

business and those currently available and emphasise the growing demand for the technical profiles produced by HVET. In response, this paper aims to analyse at state level the factors that influence the decision among young people aged 16–19 in upper secondary general education (USGE¹⁰, ISCED 3) or intermediate vocational education and training (IVET¹¹, ISCED 3) to enrol in an HVET programme.

Analysis is performed in three phases. First, HVET is contextualised in Spain to illustrate the current situation and the challenges and opportunities it faces; the literature on educational and vocational choices is then analysed to define the issue under study. Second, structured information on 16–19-year-olds collected via a survey of a statistically representative sample is described. Third, the factors determining young people's choice to enter HVET are identified and explained before, finally, the challenges encountered in advancing in this field are examined.

2. HIGHER VOCATIONAL EDUCATION AND TRAINING IN SPAIN

2.1 HVET AND ITS ROLE IN THE EDUCATION SYSTEM

The 2017/2018 academic year marks completion of implementation throughout Spain's education system of the *Ley Orgánica, 8/2013, de 9 de diciembre, para la Mejora de la Calidad Educativa* [Organic Law for the Improvement of the Quality of Education] (LOMCE) which has brought in a series of reforms that

¹⁰ It is also called 'Baccalaureate'.

¹¹ It is also called 'upper secondary vocational education' (ISCED 3). In this article the term Intermediate Vocational Education and Training (IVET) will be used.

have impacted vocational education and training (VET) and, fundamentally, the role of HVET. The previous reform of the Spanish education system, implemented by the *Ley Orgánica 1/1990, de 3 de octubre, de Ordenación General del Sistema Educativo* [Organic Law on the General Structure of the Education System] (LOGSE), aimed among its principal objectives to improve the perception of vocational and educational training and, as a result of this improvement, encourage more young people to take a vocational pathway. The underlying rationale was that to transform the economy's technology base it was necessary to increase the number of technology profiles in the labour market, as well as to improve the population's skill and qualification levels.

By the late 1990s, it was evident that the transition from compulsory to secondary and tertiary education was producing a significant gap between academic and vocational programmes. University reform and the *Ley Orgánica 11/1983, de 25 de agosto de 1983, de Reforma Universitaria* [Organic Law on University Reform] resulted in an increase in the number of universities in Spain and an unprecedented rise in the number of university places. Competition between higher vocational training and university clearly favoured the latter, due both to the above-mentioned increase in the courses on offer and to the perceived lack of prestige of pursuing post-secondary education in non-specialised centres (usually secondary schools).

At the end of 2012, and in a new socioeconomic context marked by the international financial crisis, the government brought in a new educational reform in the shape of the LOMCE. This law, which is currently in force in Spain, “*proposes a clear break with the comprehensive model of compulsory second-*

ary education” (Merino, 2013) and considers VET applied education that has to ensure “*that students acquire and extend the skills required for efficient personal and social development*” (Ley orgánica 30/2015). It likewise proposed a return to a two-qualification system at the end of compulsory education – one leading to the upper secondary general education admission exams and the other to those for vocational education and training.

The law reinforced the idea of the connectivity between the various VET cycles and even between the academic and vocational pathways. However, admission requirements were not changed. While the LOGSE considered IVET and HVET to be two independent vocational cycles,¹² the LOMCE links them together, so that after completing IVET¹³ students can either enter the labour market directly with a technical qualification or study for a further two years on a higher-level programme. Students who pass HVET receive a Higher Technical Diploma and can then either enter the labour market or take a university degree in their field of specialisation.

The LOMCE’s impact on HVET has been significant: in 2008, 81.7% of students who entered HVET did so from upper secondary general education or another HVET programme, giving them skill and knowledge levels parallel to those of stu-

12 These cycles were taken at the end of two distinct stages of education: compulsory secondary education (ISCED 2) and upper secondary general education (ISCED 3).

13 To enrol in Intermediate VET, students must have been awarded the compulsory secondary education (ISCED 2) leaving certificate or have successfully completed Basic Vocational and Educational Training. These cycles amount to approximately 2,000 hours. Basic VET is specifically designed for young people keen to enter the labour market as soon as possible. Nevertheless, under the current legislation they do also have the option to continue VET (Pin et al., 2015).

dents entering university. Admission is currently governed by quotas, with 40% of places in HVET reserved for IVET students (without an admission test), which results in widely differing knowledge levels among students on the same HVET programme.

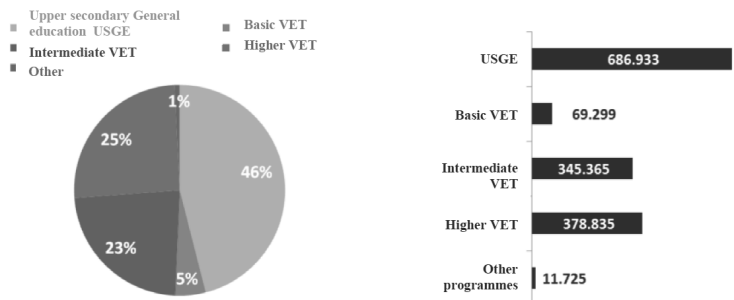
From a regulatory point of view, under the LOGSE there was greater connection between HVET and higher education; the LOMCE, however, brings HVET closer to IVET and creates separate pathways between academic and vocational training, thereby widening the gap between the academic and vocational spheres. All these factors influence young people's vocational constructs, pathways and choices.

2.2 HVET IN FIGURES

In Spain, a total of 724,200 students were on vocational education and training courses in the 2016/17 academic year (see Figure 1). A mere 12% of Spanish students are enrolled in VET programmes, as compared with 52% in the Czech Republic and Slovenia, 43% in Austria and 40% in Switzerland. The EU average stands at 29%, and that of OECD countries at 25% (OECD, 2017).

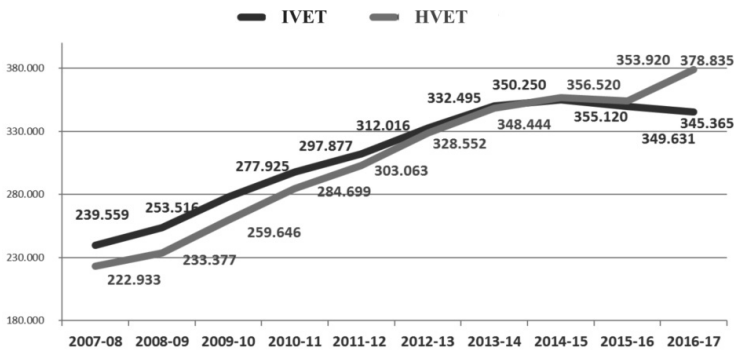
Over the last 10 years, the number of VET students has increased 1.5 times (see Figure 2). Specifically, IVET has witnessed 45% growth and HVET 70%. Consequently, since the 2015/16 academic year the number of HVET students (378,000) exceeds that of IVET students (345,000).

Figure 1:
Breakdown of students enrolled in post-compulsory secondary education, by programme



Source: Spanish Ministry of Education, Culture and Sport Database (2018).

Figure 2:
Number of students enrolled in IVET and HVET



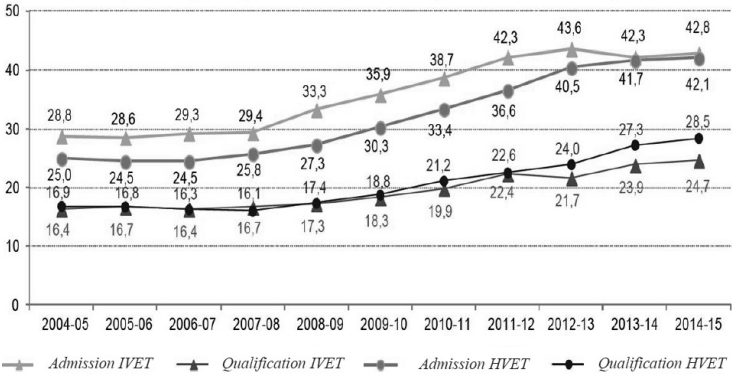
Source: Spanish Ministry of Education, Culture and Sport Database (2018).

The first challenge is to increase the number of VET graduates. It is widely acknowledged that the number of IVET and, above all, HVET graduates is nowhere near sufficient to meet the growing demand from business for qualified employees, which are essential to developing an economic model that generates more added value and competes more strongly on the international stage. The OECD estimates that technicians with IVET and HVET qualifications will account for close to two thirds of employment growth in the EU by 2020 (Cedefop, 2018).

2.3 HVET EFFICIENCY

The second challenge is to improve HVET efficiency in terms both of academic achievement and of meeting labour market needs. The early school-leaving data for HVET students show that only 28,5% of them graduate within the allotted time. This phenomenon is even more pronounced among IVET students. In 2015, more than two thirds of VET students failed to obtain their qualification within the allotted time.

Figure 3:
Percentage change in gross admission and qualification rates,
by education cycle



Source: MECD 2017c: 39

The third challenge is to align the training on offer with the demand from the labour market. According to the Spanish Public Employment Service’s report (SEPE, 2017), employment rates within a year of graduation are as high as 95% for HVET graduates with qualifications in fields like mechanical fabrication and industrial maintenance. According to several Randstad 2016/2017 reports, vacancies for personnel with qualifications in Industry 4.0 technologies are going unfilled and are creating market competition for holders of these qualifications.

Table 1.

Students enrolled in HVET by vocational family and sex.
2015–2016 school year

	Basic voc. training		Intermediate			Advanced		
	Total	% Females	Total	% Females	Admissions testing	Total	% Females	Admissions testing
TOTAL	61.909	28,9	349.631	43,1	10,4	353.920	47,6	26,2
Physical and athletic activities	-	-	8.812	20,3	12,0	19.361	19,8	26,0
Administration	11.330	49,2	51.981	61,6	8,6	52.444	63,4	27,2
Agricultural activities	3.846	20,1	7.476	13,7	13,1	5.929	19	30,8
Graphic arts	443	42,4	3.298	34,8	10,9	1.968	47,7	24,4
Crafts	-	-	-	-	-	104	43,3	-
Sales and marketing	3.226	52,7	14.851	55,9	11,5	21.546	48,2	25
Building and civil engineering works	574	12,7	819	15	8,2	4.567	32,4	14,9
Electricity and electronics	8.549	3,9	29.839	2,8	10,4	21.975	5	32,6
Energy and water	-	-	-	-	-	2.402	10,2	23,6
Mechanical manufacturing	4.537	3	12.142	2,8	12	8.113	9,5	31,8
Hospitality and tourism	5.740	37,4	20.541	38	11,2	21.914	57,4	20
Personal image	5.247	86,3	19.786	92,3	8,2	6.588	94,9	22,8
Communication, audiovisual media	-	-	3.224	33,8	12	14.135	33,8	18,9
Food industries	273	39,6	4.963	54,3	10,9	2.157	47,9	22,3
Extractive industries	-	-	119	3,4	14	-	-	-
Computer science	9.557	18,3	30.430	8,9	12,2	41.140	12,9	31,1
Maintenance and production services	261	1,5	12.481	2,1	10,5	8.003	3,2	31,9
Wood and furniture	1.523	8,5	2.764	6,6	10,1	764	23	28,5
Marine and fishing activities	9	-	1.632	6,4	7,5	1.749	10,7	22,1
Chemistry	-	-	3.100	57,0	10,8	7.319	51,0	21,9
Health	-	-	70.389	72,1	9,6	41.110	72,9	23,3
Safety and environment	-	-	87	6,9	11,3	4.517	41,2	20,5
Social, cultural and community services	201	80,6	20.913	85,6	8,3	54.423	87,7	26,3
Textiles, garment making and leather/fur	346	54,9	1.259	83,4	6,9	1.329	87,4	14,6
Automobile maintenance	6.178	1,6	28.624	2,1	12,5	10.339	2,9	33,6
Glass and ceramics	69	29,0	63	12,7	-	24	25,0	-
Non distributed	-	-	38	-	-	-	-	-

(1) Classroom and distance studies are included, except for admission data, which only refer to studies requiring classroom attendance.

Source: MECD 2017c: 21

However, the enrolment in professional vocational training families is not aligned with these vocational tendencies, but rather with ‘Social, cultural and community services’, ‘Administration’ and ‘Health’ (Table 1).

3. THEORY

Educational choices are the outcome of a set of vocational preferences that are conditioned by contextual, sociocultural and personal or cognitive-emotional determinants influenced by

time and context and that result in the choice of a specific vocation or vocational group that satisfies the individual's desire for professional achievement. The reasons behind young people's academic choices as a consequence of their interests, motivations and vocation have been studied from a variety of perspectives (Rivas 2003, Martín 2006,

Núñez and Rubio 2005, Carbonero and Merino 2004, etc.). One of those that has had greatest influence on current literature is that developed by Holland (1994), who analyses the relationship between personality characteristics, vocational choice and degree of professional satisfaction. The classical approaches to the theory of vocational choice based on Holland's typologies are complemented by the social learning approach described by A. Krumboltz (1979) and the vocational guidance approach described by Rivas (2003). Betz and Hackett (1981) formally initiated the work of applying the self-efficacy construct to the area of academic and professional development. Pursuit and extension of this line of research eventually culminated in what is currently called Social Cognitive Career Theory (SCCT), which Lent, Brown and Hackett (1994, 2000) have developed extensively. SCCT establishes a model that determines the relationship between the variables as a theoretical construct appropriate to analysis of relationships between the determinants of vocational choice. This theoretical approach maintains that subjects develop an interest in an activity when they conceive themselves to be competent at it (positive self-efficacy expectations) and when they anticipate that participating in that activity will produce outcomes considered valuable (positive outcome expectations). As regards the influence of contextual factors, SCCT (Lent *et al.*, 2013) proposes that social support and social barriers

ers influence belief of self-efficacy: the greater the perception of social support and of fewer social barriers, the greater the belief in self-efficacy.

From this perspective, classification of the determinants of vocational choice (Rivas 2007, Blanco 2009, etc.) considers that determinants have a dual nature: on the one hand, they are individual and are influenced by physical, psychological and pedagogical-academic factors; and on the other, they are contextual and are influenced by institutional and socioeconomic factors. In this respect, and emphasising the family socialisation and school institutionalisation processes, from the perspective of vocational guidance it is proposed that there are essentially three indicators conditioning vocational decision-making (Cepero, 2010). Firstly, there are the subjects' self-perceived qualities that decisively influence their vocational preferences and educational choices, particularly when the self-perceived qualities coincide with the reason for the choice. Secondly, there are the family income level and average grade from the previous academic year, which definitively and directly influence the decision to continue in education or not. Finally, one of the main reasons for the choice of post-secondary education is the personal appeal of the profession and the prospects it offers of a good job with a good salary.

Qualitative studies conducted in Spain (Merino, 2007) on the numbers of students entering VET programmes indicate that young people principally base their choice between the various options on four factors. First is differential socialisation, which is strongly influenced by family background (level of education, occupation and socioeconomic status) and by the expectations associated with gender and social and ethno-cul-

tural groups. Socioeconomic status is associated with *'significant differences in rates of participation in post-compulsory education between children of members of the professions and those of members of the lower-middle and working classes,'* (Calero, 2006) in that it is much more frequent for the latter to enter vocational education and training. Second is the guidance received from their immediate circle — family, peer group and school tutors. Third are academic variables, specifically academic achievement before reaching the stage of choosing between the various vocational options. For example, achieving good results in IVET can encourage students to enrol in HVET in their specialisation (Carabaña, 1997). Finally, fourth comes the rational cost-benefit-risk analysis that also forms part of young people's decision-making process, since young people analyse both the opportunity costs and the costs of the alternatives.

In this paper, the determinants of young people's choice to enrol in HVET as the culmination of their upper secondary education (ISCED 3) is analysed from the perspective of the multiple personal and contextual determinants (Rivas 2007, Fernández, Viñuela and Torío 2007). The analysis is based on the assumption that there are two types of variables: individual and social. The first are the physical, psychological and pedagogical-academic factors determined by physical, academic, technological, career expectation and decision-making variables. The second are the variables determined by the institutional structure (including school, information and guidance), socioeconomic variables (family background) and technology (see Table 2). Both the individual and social variables are systematically integrated into an interconnected reality receiving constant feedback.

Table 2.
Framework and variables to be analysed

Individual level	Variables
Physical variables	Gender, age
Scholar variables	Educational programme being studied, level of studies, general cognitive area/ vocational family, decision about type of programme to study, number and level of languages, competence for using the internet.
Academic achievement variables	Repeated academic year, temporal school leaving, change of school
Career expectation variables	Getting a job, type of organisation in which the student wishes to work, interest in entrepreneurship, motivation to study and/or work intention and motivation to work abroad, opinion on the relevance of the student's studies to the world of work, level of efficacy in working in their field of qualification, interest in new forms of employment, and perception of the role of new technologies in their future work.
Social level	Variables
Institutional variables	Type of centre and access to Internet.
Family background	Employment status, level of education of parents, province of residence.
Information and guidance variables	Type of sources consulted to inform their decision, utility of the information received and adequacy of the guidance.

Source: Compiled by authors.

4. METHODS AND RESULTS

4.1 METHODS

The research methodology combines qualitative (literature review) and quantitative (survey and statistical data) analysis, the results of which will be explored to draw conclusions about the object of study and the area of research. The study's value lies in researching an original topic of significant interest that has received little attention in Spain and in having a significant quantitative sample with which to investigate the object of study.

Firstly, a questionnaire was designed featuring 42 variables related to students' academic and sociodemographic characteristics, educational preferences, career aspirations and familiarity with technology. Most of the variables are categorical and fall within the following 6 areas:

- Characterisation of the student: age, sex, province of residence, educational programme being taken, area or branch of knowledge being studied, type of centre and competence with and motivation for using the Internet.
- Academic achievement: change of primary or secondary school (excluding changes required by progression from one stage to the next), repeat of academic year and early school-leaving.¹⁴
- Career prospects: getting a job, type of organisation in which the student wishes to work, interest in

¹⁴ One restriction on measuring academic achievement is that the average grade of the previous academic year was not included in the survey for reasons of confidentiality and to ensure operational feasibility.

entrepreneurship, intention and motivation to work abroad, opinion on the relevance of the student's studies to the world of work, level of efficacy in working in their field of qualification, interest in new forms of employment, and perception of the role of new technologies in their future work.

- International experience: number of languages spoken and standard of competence (accredited or being studied), residence in other countries and intention and motivation to study in another country.
- Information and guidance: type of sources consulted to inform their decision, utility of the information received and adequacy of the guidance.
- Family background: employment status and level of education of parents.
- Scholar features: decision and motivation to study and/or work, decision about type of programme to study and access to ICTs.

Secondly, the information-gathering process, target population and data-capture instruments were defined. On the one hand, it was decided to approach the target population (students aged between 16 and 19) via the regional education authorities, asking them to distribute the questionnaire to schools within their jurisdiction. On an institutional level, an email was sent to the head teachers of secondary schools running upper secondary and VET programmes explaining the reason for the survey, asking for the schools' collaboration and including a link to the document. The authors suggested that students spend 10–12 minutes filling in the questionnaire during school hours.

The information was collected in the Computer-Assisted Web Interviewing (CAWI) format and, after the responses had been obtained, it was analysed, processed and validated. This methodology was primarily employed for legal reasons as it required contacting minors directly. It was secondarily used because of its compatibility with the cultural and communication habits of the population selected. The fieldwork and data employed in this research were obtained in partnership with GAD3 under the Educa 2020 project on career prospects for young people (Serraniados and GAD3, 2017).¹⁵

The sample comprises a population of VET and upper secondary general school students aged between 16 and 19. Sample size amounted to 10,743 interviews conducted in all of Spain's provinces, including Ceuta and Melilla.¹⁶ Of that total, 3,137 respondents were VET students (2,112 were taking IVET and 1,025 HVET). The sampling error is $\pm 0.9\%$ ($N = 10,743$) for a confidence level of 95.5% (two sigmas) and in the worst case scenario of $P=Q=0.5$ (on the assumption of simple random sampling). Logistic regression analysis using the SPSS software was applied to the data as it was considered the most appropriate way of modelling the factor-based probability of studying HVET.

15 This phase drew on the work of the Instituto GAD3 under the Educa 2020 project on career prospects for young people (2017) and employed the survey microdata held by Serraniados. The fieldwork was conducted by GAD3 between 31 January and 21 April 2017.

16 As regards sample allocation, weighting coefficients based on level of education, autonomous community and school affiliation were applied to ensure the representativeness of the sample.

4.2 RESULTS

The section below presents the results of logistic regression, which is articulated in three models based on the level and type of programme being studied at the time of the survey. In analysis of the factors determining the decision to take an HVET qualification, the students were separated into three distinct categories depending on the level of qualification being taken: Baccalaureate, IVET or HVET. Consequently, the determinants in play when deciding whether to enrol in HVET will be different for each cohort:

- What are the determinants influencing an upper secondary general student's decision to take an HVET qualification?
- What are the determinants influencing an IVET student's decision to take an HVET qualification?
- What are the determinants influencing an HVET student's decision to take a further HVET qualification?

To discover this, it is first necessary to determine each cohort's probability of taking an HVET qualification:

	Wish to take an HVET studies
Baccalaureate	9.8%
IVET	63.7%
HVET	16.0%
Total	21.0%

Applying the logistic regression model obtains a model for each student cohort. Consequently, the results are structured into three categories according to the student's level of education (1. Baccalaureate; 2. IVET; 3. HVET). Each level is accompanied by an explanation of the model, interpretation of the data and other variables explaining the decision.

First, the regression model is presented for those students who are studying Baccalaureate programmes (i.e. those with a 9.8% probability of enrolling in HVET). It is determined by the following variables:

- Level of programme currently studied (in this case, Baccalaureate).
- Father and mother hold university degrees.
- Have repeated an academic year.
- Consider new technology to be relevant to their future work.
- Have temporarily left school at some point.
- Study at a state school.

The model is shown below.

$$\begin{aligned}
 Z = & (\beta_1 \times \text{Upper secondary programme}) + (\beta_2 \times \text{Parents hold degrees}) + \\
 & + (\beta_3 \times \text{Repeat academic year}) + (\beta_4 \times \text{New technology}) + \\
 & + (\beta_5 \times \text{Temporarily left school}) + (\beta_6 \times \text{State school})
 \end{aligned}$$

The parameters are calculated as follows:

$$\begin{aligned} Z = & (-1,979 \times \textit{Upper secondary programme}) \\ & + (-0,935 \times \textit{Parents hold degrees}) \\ & + (0,571 \times \textit{Repeat academic year}) + (-0,253 \times \textit{New technology}) \\ & + \\ & + (-0,374 \times \textit{Temporarily left school}) + (0,192 \times \textit{State school}) \end{aligned}$$

This model presents an R² of 0,569. Its contingency table is as follows:

Table 3.
Contingency table – upper secondary general students who wish to take an HVET qualification after completing their current course

Observed		Predicted		
		Enrol in HVET when current course completed (D)		Correct percentage
		Others	HVET	
Enrol in HVET when current course completed (D)	Others	3964	4522	46.7
	HVET	216	2041	90.4
Overall percentage				55.9

As the figures show, model specificity and sensitivity for HVET students are very high (90.4%). Based on the 6 predictive variables mentioned above, the model correctly classifies the students taking HVET qualifications in 90.4% of cases. To obtain this table, the probability of taking a VET qualification was set at 0.098 (i.e. 9.8% of the students surveyed select HVET and the rest take a university degree or enter the labour market).

Table 4.
 Model 1. Factors influencing whether an upper secondary student
 enrolls in HVET

	B	E.T.	Wald	gl	Sig.	Exp(B)
Baccalaureate	-1.979	.052	1436.684	1	.000	.138
Father and mother hold university degrees	-.935	.086	118.350	1	.000	.392
Academic year repeated	.571	.054	113.015	1	.000	1.769
New technology	-.253	.049	26.769	1	.000	.777
Left school	-.374	.096	15.091	1	.000	.688
State school	.192	.052	13.599	1	.000	1.212

The variables are ranked in descending order of importance according to Wald statistic. Studying an upper secondary programme is the factor that has greatest influence in the model; only one in ten students in this cohort decide to take an HVET qualification rather one of the other education options. Thus, studying a Baccalaureate programme reduces the probability of enrolling in HVET ($\beta_1 = -1,979 < 0$). Parents’ level of education also appears as a decision determinant. In this case, if both parents hold university degrees the probability of taking an HVET qualification decreases ($\beta_2 = -0,935 < 0$).

Having repeated an academic year at some point in the past is another decision determinant. However, in this particular case, the probability of enrolling in HVET falls if the student temporarily left school in the past. Thus, having repeated an academic year increases the probability of taking an HVET qualification

($\beta_3 = 0,571 > 0$) while having temporarily left school at some point has a negative effect on the decision ($\beta_5 = -0,374 < 0$).

Regarding the student's future career, considering new technology to be relevant to his or her future work is less of a decision determinant and has a negative influence on the decision to enrol in HVET ($\beta_4 = -0,253 < 0$). Finally, studying at a state school positively influences the decision ($\beta_6 = 0,192 > 0$).

Other variables not included in the model but which help to understand why an upper secondary student will decide to study VET are described below (ranked in descending order of importance):

Table 5.

Other variables that influence the choice to take an HVET qualification among upper secondary students

	B	E.T.	Wald	gl	Sig.	Exp(B)
Father or mother holds a university degree	-.279	.072	15.030	1	.000	.757
Change of school	-.146	.054	7.387	1	.007	.864
Find work	.112	.056	3.964	1	.046	1.118

Second, the regression model is presented for those students who are studying for an IVET qualification (i.e. those with a 63.7% probability of enrolling in HVET) determined by the following variables:

- Level of programme currently studied (in this case, IVET).

- Consider new technology to be relevant to their future work.
- Mother holds a university degree

The model is shown below.

$$Z = (\beta_1 \times \text{IVET programme}) + (\beta_2 \times \text{New technology}) + (\beta_3 \times \text{Mother holds degree})$$

The β_j : parameters are calculated as follows:

$$Z = (1,997 \times \text{IVET programme}) + (-1,456 \times \text{New technology}) + (1,346 \times \text{Mother holds degree})$$

This model presents an R^2 of 0,504. Its contingency table is as follows:

Table 6.

Contingency table – IVET students who wish to take an HVET qualification after completing their current course

Observed		Predicted		
		Enrol in HVET when current course completed (D)		Correct percentage
		Others	HVET	
Enrol in HVET when current course completed (D)	Others	7801	685	91.9
	HVET	1107	1150	51.0
Overall percentage				83.3

To obtain this table, the probability of taking a VET qualification was set at 0.637 (i.e. 63.7% of the students surveyed select HVET and the rest take an upper secondary general programme).

Table 7.
Model 2. Factors influencing whether an IVET student enrolls in HVET

	B	E.T.	Wald	gl	Sig.	Exp(B)
New technology	-1.456	.038	1458.356	1	.000	.233
IVET	1.997	.058	1205.186	1	.000	7.368
Mother holds university degree	-1.346	.058	539.155	1	.000	.260

The variables are ranked in descending order of importance according to Wald statistic. The most influential factor is believing that new technology will be relevant to the student's future work, a belief that negatively influences the decision to take an HVET qualification ($\beta_1 = -1.456 < 0$). Taking an IVET qualification has a very positive impact on the probability of enrolling in HVET ($\beta_2 = 1.997 > 0$). Finally, the fact that the mother holds a university degree is more relevant than if the father holds one. Moreover, this circumstance reduces the probability ($\beta_3 = -1.346 < 0$).

Other variables not included in the model but which help to understand why an upper secondary student will decide to study VET are described below (ranked in descending order of importance).

Table 8.

Other variables that influence the choice to take an HVET qualification among IVET students

	B	E.T.	Wald	gl	Sig.	Exp(B)
State school	-.650	.050	166.231	1	.000	.522
Change of school	-.465	.053	76.460	1	.000	.628
Future work	-.365	.052	50.077	1	.000	.694
Academic year repeated	.421	.061	47.538	1	.000	1.524
Father holds university degree	-.575	.102	31.458	1	.000	.563
Father and mother hold university degrees	-.469	.151	9.659	1	.002	.626
Left school	-.225	.106	4.536	1	.033	.798

Third, the regression model is presented for those students who are studying for an HVET qualification (i.e. those with a 16.0% probability of enrolling in HVET). It is determined by the following variables:

- At least one parent holds a university degree.
- Have repeated an academic year.
- Consider new technology to be relevant to their future work.
- Level of programme currently studied (in this case, HVET).
- Study at a state school.

The model is shown below.

$$\begin{aligned}
 Z = & (\beta_1 \times \textit{Father or mother holds degree}) + (\beta_2 \times \textit{Repeat academic year}) \\
 & + (\beta_3 \times \textit{New technology}) + (\beta_4 \times \textit{HNET programme}) \\
 & + (\beta_5 \times \textit{State school})
 \end{aligned}$$

The parameters are calculated as follows:

$$\begin{aligned}
 Z = & (-1,388 \times \textit{Father or mother holds degree}) \\
 & + (1,198 \times \textit{Repeat academic year}) + \\
 & + (-0,851 \times \textit{New technology}) \\
 & + (-1,396 \times \textit{HNET programme}) + \\
 & + (-0,538 \times \textit{State school})
 \end{aligned}$$

This model presents an R² of 0,461. Its contingency table is as follows:

Table 9.
Contingency table – HNET students who wish to take an HNET qualification after completing their current course

Observed		Predicted		
		Enrol in HNET when current course completed (D)		Correct percentage
		Others	HNET	
Enrol in HNET when current course completed (D)	Others	3771	4715	44.4
	HNET	338	1919	85.0
Overall percentage				53.0

Model specificity and sensitivity for HVET students are very high (85%). Based on the 5 predictive variables mentioned above, the model correctly classifies the students taking HVET qualifications in 85% of cases. To obtain this table, the probability of taking a VET qualification was set at 0.16 (i.e. 16% of the students surveyed select HVET and the rest take a university degree or enter the labour market).

Table 10.
Model 3. Factors influencing whether an HVET student enrolls in HVET

	B	E.T.	Wald	gl	Sig.	Exp(B)
Father or mother holds a university degree	-1.388	.052	724.491	1	.000	.250
Academic year repeated	1.198	.051	555.494	1	.000	3.313
New technology	-.851	.042	409.116	1	.000	.427
HVET	-1.396	.095	216.579	1	.000	.248
State school	-.538	.047	132.972	1	.000	.584

The variables are ranked in descending order of importance according to Wald statistic. The fact that at least one parent holds a university degree is the most influential variable and, as it is less than 0, it negatively influences the decision to take an HVET qualification ($\beta_1 = -1.388 < 0$). As in the other cases, repeating an academic year has an impact on the model and positively influences the decision to take a further HVET qualification ($\beta_2 = 1.198 > 0$). Conversely, the belief that new technology will be relevant to the student's future work reduces the probability ($\beta_3 = -0.851 < 0$). It should be noted that this is a subjective opinion of a future scenario while the other variables can

be considered objective in that they refer to concrete facts. In this model, currently taking an HVET qualification is ranked second from bottom. Moreover, currently taking that qualification diminishes the probability of enrolling in others, since most students in this educational programme decide to enter the labour market or take a university degree.

Finally, studying at a state school makes it less probable that the student will enrol in an HVET programme ($\beta_5 = -0,5389 < 0$).

Other variables not included in the model but which help to understand why an HVET student would decide to enrol in another HVET programme are described below (ranked in descending order of importance):

Table 11.
Other variables that influence the choice to take an HVET qualification among HVET students

	B	E.T.	Wald	gl	Sig.	Exp(B)
Find work	.316	.054	34.294	1	.000	1.372
Change of school	-.177	.051	11.877	1	.001	.838
Left school	.313	.101	9.544	1	.002	1.368
Start company	-.146	.051	8.158	1	.004	.864
Entrepreneur father	-.277	.122	5.134	1	.023	.758

In comparative terms, it could be said that achievement variables determine the decision to choose HVET (specifically, repeating an academic year), while those that determine the decision to discard that option are whether the mother holds a university degree and whether the student sees ICT as playing a key role in his or her future work.

5. ANALYSIS AND DISCUSSION

Overall, 21% of the students in the sample (10,743 students aged 16–19) wish to take an HVET qualification. This probability varies according to the level of the programme they are currently studying: Baccalaureate, IVET or HVET. Practically two thirds of IVET students choose HVET. Of those students who choose HVET qualifications, 16% are currently taking one. This correlates with the age of the respondents, since the age of admission to HVET is 18–19. Finally, one in every ten upper secondary general students wish to take an HVET qualification, a figure that justifies differentiated analysis of the factors determining the choice to enrol in HVET.¹⁷

Analysis of the data reveals the high probability among IVET students as opposed to the low probability among those enrolled in an upper secondary general programme. On the one hand, this high probability is consistent with the pathways laid out by the current education legislation (LOMCE), which has eliminated the HVET admission exam for IVET students and sets admission quotas that favour this cohort's enrolment in HVET programmes. On the other, the low probability of Baccalaureate students may be associated with the fact that the academic achievement of those that do choose VET is usually lower in

17 The areas or fields of knowledge (or occupational programmes in the case of VET) that students who wish to take an HVET qualification are currently studying have not been included because errors and inconsistencies were found in the responses. These could be connected to the design of the question that combined responses from upper secondary and VET students and is an area that will be improved in future research

terms of academic years repeated and temporary school-leaving.¹⁸ It appears that those students that enrol in HVET programmes have had greater difficulties passing the upper secondary exams and come from state schools. This finding is in line with other research conducted in Spain.

Table 12.
Framework and variables analysed

Individual	More influence (models)	Less influence
Physical variables	-	-
Academic achievement variables	Repeated academic year	Temporarily left school
Career expectation variables	Perception of new technology being of little relevance to future work	Find work
Social	More influence (models)	Less influence
Institutional variables	State school (upper secondary education)	-
Family background	Mother and/or father hold university degree	-
Information and guidance variables	-	-

Source: Compiled by authors.

The variables with most comparative influence on the three cohorts—both positive and negative—are set out in Table 2. It should be noted that the probability of taking an HVET quali-

18 These changes do not include changes of school required by progression from one educational stage to the next.

fication is inverted when the parents, particularly the mother, hold university degrees. This indicates that in families with a high level of education, social recognition of HVET is lower than that of university education and that the family's educational model repeats itself. It also indicates that vocationally-oriented academic information and guidance has minimal influence on educational choice.

Similarly, the perception that new technology will be relevant to the student's future work has a negative influence on all the cohorts that wish to take an HVET qualification. This is noteworthy as it runs counter to technology's growing influence on the construction of career pathways that, in turn, are increasingly aligned with an ever-more demanding and specialised labour market. The relevance of technology, particularly ICTs, is growing in the European context both within tertiary education (which includes HVET) and as regards its alignment with the European Qualifications Framework.

Another variable that positively influences the choice to enrol in HVET, albeit less strongly, is the expectation that it will help the student find work. This is extrapolatable to all three cohorts, since young people analyse both the opportunity costs and the costs of the alternatives.

To conclude, it can be said that both variables—individual and social—influence the decision to take an HVET qualification and that two differentiated pathways are most prevalent: upper secondary general education and VET. The factor common to all the cohorts when deciding to enrol in an HVET programme is associated with academic achievement (repeating an academic year) and, in the case of upper secondary students, studying at a state school. The factors that decrease the

probability of enrolling in an HVET programme are related to family background (parents with university degrees) and expectations (perception of the relevance of new technology to the student's future work). It is also noteworthy that all the cohorts that choose HVET share the expectation that the qualification will help them find work. Physical and information and guidance variables are not considered influential in these three models.

6. CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The current legislation, as set out in the LOMCE, favours the link between IVET and HVET in quantitative terms of the increase in the number of students following this pathway, as both this research and official data indicate. However, one of the effects of this tendency to remain within the VET framework is the segregation of academic and vocational education, which distances HVET from other tertiary education.

At institutional level, the nature and role of the schools play an important part in the decision to enrol in HVET. Specifically, state schools favour enrolment in VET by students with lower levels of academic achievement. In this regard, and taking into account that most VET programmes are hosted in secondary schools, the tendency is for upper secondary students to distance themselves from HVET in particular and VET in general. This provides grounds for reflection about who promotes VET in Spain, its nature and where it is taught. Currently, VET is hosted in state secondary schools when it should be taught in specialised, integrated centres.

The fact that only a fifth of young people choose HVET, a figure consistent with official data, points to a future shortage of the skilled professionals that the labour market demands. Likewise, the degree of alignment between the skills needed by competitive sectors at state and regional level, as per the Research and Innovation Smart Specialisation Strategy (RIS₃), and the VET on offer should be analysed. This would encourage the present and future needs of business to be taken into account when designing and planning HVET programmes, thereby aligning supply and demand for VET.

The fact that technology is not perceived by students who choose HVET as being of key relevance to their future work is indicative of the lack of focus on technology within the VET system in general. This is consistent with the finding that the most commonly selected occupational programmes have a comparatively lower technology content. The challenge presented by technology and digitalisation is common across the EU and further progress must be made in this field in Spain.

Low academic achievement and dissatisfaction with school continue to be associated with VET. The influence of academic achievement (in terms of repeating academic years or temporarily leaving school) on the decision to choose HVET highlights the need to reflect on the efficiency of the VET system, and in particular HVET, and on its efficacy in producing professionals with the skills needed to succeed in the labour market. It is important to reflect on and investigate further the functionality of the VET system in terms of enrolment and/or competences.

Socialisation, especially primary, influences educational choices, with parents (particularly mothers) being most influential. This indicates the need to reflect on the information

and guidance systems in place in Spain and to consider how to develop useful, dynamic, high-quality academic and vocational guidance systems.

Information and guidance are essential to meeting social and economic needs, firstly in preventing young people becoming frustrated and leaving school, secondly in providing them with knowledge, competences and skills relevant to their personal and professional lives, and thirdly in providing future professionals with a thorough grounding in technology that meets the changing needs of business.

In general terms, it can be said that it is important to reflect on, investigate and advance towards a VET system that delivers the high standards of efficiency, effectiveness and innovation needed to meet the current and future requirements brought by Spain's social and economic transformation.

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The Academic Professionalisation of Business Education as a Science – A Collective-Biographical and Network-Analytical Study of Discipline Formation in the German-speaking Area in the 20th Century

Mathias Götzl*, Patrick Geiser, Robert W. Jahn & Hannah Frind

Abstract: As a result of an analysis of the sociology of vocational and business education (resp. VET in the German-speaking area) as science, Reinisch (2009) found that it had already reached the stage of ‘established science’ decades ago (Clark, 1972, 1974).

Furthermore he states it is currently a ‘normal science’ (Kuhn, 1962, 2014). Since it is a part of normal science to ascertain its origins, he sees a significant need for research on the history of vocational and business education. (Reinisch 2009, 2010)

The process of the formation and the establishment of (vocational and) business education as a science or as a partial discipline of educational science is traditionally described in the context of the setting-up of teacher training courses for vocational education in higher education institutions during the transition from the 19th to 20th centuries (Pleiß, 1973, Czycholl, 1974, Zabeck, 2009, 520–534, Reinisch, 2010, 181–183). Consequently, the process of institutionalisation or professionalisation

is primarily characterised as being externally induced. Other relevant prospects and explanatory approaches are rare, especially internal scientific processes, which are taking the social organisation and the individuals into account (Kipp & Miller-Kipp, 1994, Reinisch, 2009, 2010).

The contribution focuses on the internal process of the academic formation and establishment of (vocational and) *business education* as a science or as partial discipline(s) of educational science in the 20th century. Starting with theories of science (e.g. Stichweh, 2013; Ambrose, 2010; Clark 1972, 1974) in consideration of the establishment thesis of Reinisch (2009, 2010) and the generation thesis of Zabeck (2006), the study will

contribute to a deeper understanding of the formation and establishment of VET as a science in the German-speaking area.

For this purpose the professors, as well as their generational relations are considered. The methodological access is achieved through a collective-biographical-quantitative approach (Schröder, 2011) by means of network analysis with the application software NetDraw (Stegbauer & Rausch, 2013).

Keywords: History of VET, esp. establishment of business education, collective biographical, network analysis

1. INTRODUCTION

Every scientific discipline goes through a process of development from the humble beginnings as an (academic) idea to the perception as an epistemic authority. Reinisch (2009, pp. 1, 13) states in a socio-scientific analysis of vocational and business education (resp. 'Berufs- und Wirtschaftspädagogik' or VET as a science

in the German-speaking area) that this has decades ago reached the status of an 'established science' (Clark, 1972, 1974) and is presently hold a status as 'normal science' (Kuhn, 1962, 2014). In this respect, he concludes, it is also part of normal science that the members of the corresponding discipline repeatedly ascertain their own foundations. In this respect, Reinisch sees a considerable need for research (Reinisch, 2009; Reinisch, 2010).

The differentiation process (Stichweh, 2013, p. 15) of vocational and business education as educational science (partial-) discipline(s)¹⁹ is traditionally described in the corresponding contributions of historical vocational and business education research against the background of the establishment of teacher training programmes for vocational and commercial schools (e.g. Pleiß, 1973; Czycholl, 1974; Zabeck, 2009a, pp. 520–534; Reinisch, 2010, pp. 181–183). Accordingly, their non-simultaneous constitution and development (e.g. Zabeck, 2009a, pp. 528–532; Büchter, Klusmeyer & Kipp, 2009; Lisop, 2009a) is presented primarily as being exogenously induced. Endogenous or inner-scientific differentiation processes (Stichweh, 2013, p. 15), which focus on the formation of internal scientific systems and are equally important for comprehensive reconstruction, have so far been largely ignored – apart from a few noteworthy approaches (Kipp & Miller-Kipp, 1994; Klusmeyer, 2001; Reinisch, 2009, 2010). As a result, the relationship between internal and external differentiation of vocational and business education and neighbouring academic (partial- and/or sub-)

19 If we use the term (partial-)discipline in the following, we assume that this is an established scientific discipline in the sense of Clark (1972, 1974) (cf. chapter 2.1). The term (sub-)discipline, on the other hand, is used when this stage does not yet appear to have been reached.

disciplines – such as social pedagogy (e.g. Ostendorf, 2009), nursing pedagogy (e.g. Reiber & Remme, 2009) or economic education – has so far hardly become the subject of systematic considerations.

Our initial focus is on vocational and business education and its internal differentiation as a communication community of scientists. In a long-term perspective, we are aiming at questions about the development and the internal and external constitution of vocational and business education as well as its relations and demarcation lines to neighboring (partial- and/or sub-) disciplines by the quantitative and qualitative analysis of scientific communication relations. In this respect, our studies should lead to a deeper understanding of the development and shaping of vocational and business education as (partial-) discipline(s) and its relevance within educational science.

An ideal-typical (inner-)differentiation of humanities and social scientific (partial- and sub-)disciplines can be found in Ambrose (2010), which, based on studies in interdisciplinary creativity research (Ambrose, 2006), economics, political science, English studies, analytical philosophy (Bender & Schorske, 1997) and in the field of gifted education (Ambrose, 2010), provides a four-level analysis framework of disciplinary patterns of structures and dynamics. In the course of this, he contrasts two types of disciplines: on the one hand, unified, insular, firmly policed, and on the other hand, pluralistic, fractured, porous, contested academic disciplines (Ambrose, 2010, p. 472). Within the disciplines, a distinction is made between the four levels of a) practice b) research c) theory and d) philosophy, which he describes as homogeneous in and beyond the analytical levels for uniform disciplines and as fragile or hetero-

geneous for pluralistic disciplines. As a result, the structures and dynamics of uniform disciplines exhibit a high degree of coherence, limiting the intrusion and penetration of interdisciplinary ideas and thought processes on all levels, both horizontally and vertically, while pluralistic disciplines in and beyond the levels are open to other disciplines and have low vertical coherence (also Keiner & Schaufler, 2014, pp. 272–273). Against the background of this primary descriptive-analytical framework, various (partial-)theories of the broad field of science studies (e.g. Kuhn, 1962 or Clark, 1972), can be used to describe and explicate the development and constitution of (partial- and/or sub-)disciplines.

However, before such wide-ranging analyses or even partial analyses of communicative system formation processes of vocational und business education (and neighboring partial- and/or sub-)disciplines seem possible, a suitable basis, more specifically a population of the units or potentially relevant subjects involved in the communication is required. We want to outline this in a first attempt in the form of a collective-biographical and network-analytical approach, starting with *business education* (BE). In this contribution, therefore, only a part²⁰ is presented in which we examine the process of the (academic) development and establishment of the BE as a science or educational science (partial-)discipline in the 20th century on the basis of a (partial-)theory of scientific research. In this respect, we follow on from the above-mentioned establishment thesis

20 The restriction to BE is to be legitimised on the one hand by an interim research pragmatic limitation and on the other hand by the non-simultaneity of the academic constitution and the development of vocational and business education (see above).

of Reinisch (2009) and sketch the development and establishment of the BE against the background of Zabeck's (2006) generational classification along the stage model of the institutionalisation process of scientific disciplines of Clark (1972, 1974) (cf. chapter 2.1). The focus is on the question of whether BE – as Reinisch states – is an *established* educational science (partial-) discipline or science in the sense of Clark and whether an establishment period can be narrowed down. The methodological research access (cf. chapter 2.2) is carried out by a collective-biographical-quantitative data collection (Schröder, 2011) of the professors²¹ of the BE. UCINET and NetDraw (Stegbauer & Rausch, 2013) are used to carry out the network analysis of the relevant data of the collective-biographical data corpus. Afterwards we will present our first (preliminary²²) results (cf. chapter 3). The paper concludes with an outlook on the extension of the data corpus, the optimisation of the data structure, preparation and evaluation as well as on research cooperation's and perspectives (cf. chapter 4).

- 21 The data corpus does not currently contain junior professors (W1). As a first step, we have placed them on an equal footing with habilitants. In the future, however, the data corpus is to be extended to all habilitated scientists (of vocational and business education) with teaching authority (*venia legendi*) and with independence in research and teaching (without habilitation) and thus includes private lecturers and junior professors.
- 22 In view of the continuation and completion of the data collection and against the background of an empirical foundation of generation classification or another grouping or periodisation that is still outstanding, our findings are to be regarded as preliminary.

2. THEORY AND METHODS

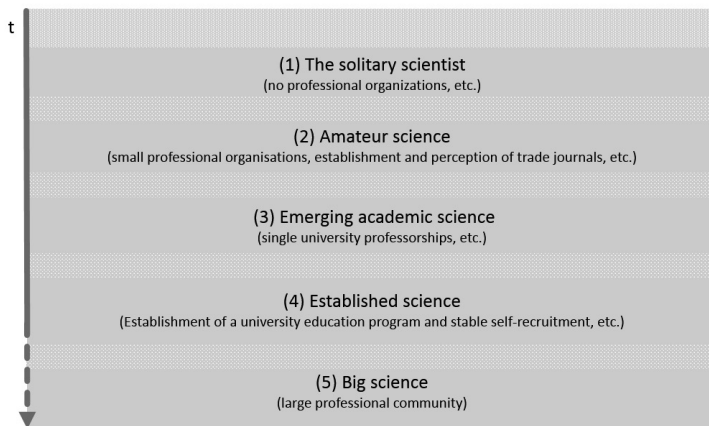
A. THEORY

Clark (1972) describes three fundamental elements in his abstracted institutionalisation of scientific disciplines, taking as an example the creation of sociology and related social sciences in France (1880–1914) (Clark, 1973). These elements are firstly ‘a set of coherent ideas, some sort of *paradigm*’ (Clark, 1972, p. 658), secondly ‘*talented individuals* to expand these ideas’ (Clark, 1972, p. 658), and thirdly ‘*institutionalisation* of the basic structures for preservation and extension of ideas in the area’ (Clark, 1972, p. 658). Based on this, he develops a five-stage expansion model of scientific disciplines (cf. Figure 1), in which he outlines ‘interrelations among these three sets of variables in terms of five stages of scientific growth’ (Clark, 1972, p. 661).

According to this model every new discipline’s development process begins with the stage of the ‘solitary scientist’ who begins to describe and analyse an excerpt of his environment in a hitherto unknown way or perspective. If he communicates his ideas and finds listeners or readers who are willing to give at least part of their resources for the continuation of communication, the new field enters the stage of ‘amateur science’, at the end of which stands the creation of the first small professional organisations and the establishment and perception of journals (Clark, 1972, pp. 661–663; Reinisch, 2009, p. 189). This process – which we do not consider here – is already apparent for the BE in the 19th century or at the transition into the 20th century at the latest (also Pleiß, 1973; Zabeck, 2009a, pp. 512–528). For an empirical analysis of this

period, numerous data on the actors involved and the emerging institutions are missing. This process remains a desideratum for the time being.

Figure 1:
Clark's stage model of the institutionalisation process of scientific disciplines, Source: Own presentation based on Clark (1972, pp. 661–669)



The third stage, the ‘emerging academic science’ begins with the establishment of professorships at higher education institutions or universities.

For the first time, the BE system achieved this status with the establishment of the professorship for ‘kaufmännisches Unterrichtswesen’ (transl. ‘commercial school education’) at the ‘Handelshochschule Berlin’ (transl. ‘Higher education institution of commerce Berlin’) in 1906 and its appointment by Carl Theodor Dunker (1860–1910). After Dunker’s early death, this professorship was not reoccupied, so that it took until 1923 to establish a professorship for ‘Handelsschulpädagogik und

betriebswirtschaftliche Nachbargebiete' (transl. 'commercial school education and commercial science neighbouring areas') at the "Handelshochschule Leipzig" (transl. 'Higher education institution of commerce Leipzig') and to fill it with Karl von der Aa (1876–1937). With some justification, this department can be described as the first 'business education' professorship at a German higher education institution²³; although the denomination 'business education' was first used in 1930 for the appointment of Friedrich Feld (1887–1945) at the 'Handelshochschule Berlin' (Reinisch, 2009, p. 1).

If the holders of these first professorships succeed, among other things, in establishing a graduate training program in the form of a university-anchored degree course, in ensuring stable self-recruitment from their own junior scientists and subsequently in promoting a quantitative expansion of the academic discipline, the fourth stage of 'established science' is reached (Clark, 1972, pp. 661, 663–666; Reinisch, 2010, pp. 189–190). The fifth and final stage of 'big science' is also ignored here, as this contribution focuses on the establishment of the BE.

As already quoted at the beginning, Reinisch (2009, pp. 1, 13) explicates in his scientific sociological analysis of the vocational and business education that it achieved the status of an established science decades ago and is currently a normal science. In this respect, he concludes, it is also part of normal science that the members of the corresponding discipline repeatedly verify their own foundations and indicates a considerable need for research (also Reinisch, 2010). We take these remarks as a two-fold reason for this contribution. On the one hand, an empirical

23 We follow this view of Reinisch in our analysis (see Figure 5).

examination of Reinisch's determination of the degree of institutionalisation of the vocational and business education is pending. On the other hand, with the scientific demand of self-assurance, it provides a basis of legitimacy, if not even an invitation, for such an empirical analysis (also Zabeck, 2006, 2009b; Büchter, Klusmeyer & Kipp, 2009; Lisop, 2009a, 2009b).

In his remarks, he not only assigns the vocational and business education the status of an established science, but also marks a period of time in which the transition has taken place. With the term 'decades', which he has chosen but not specified in more detail, he focuses in our understanding on a period 30–40 years ago, ca. 1970 to 1980. The basis on which he makes this assessment remains open and implicitly raises the question of whether the vocational and business education is actually an established science or scientific (partial-)discipline because Reinisch can only prove this to a limited extent. In addition, the question arises from which period of time onwards we can consider the focused BE as an established science or an established educational science (partial-)discipline.

Nevertheless, Reinisch was not the only one in the vocational and business education who dealt with the development of his own field. Another well-known representative was Zabeck (2006), who dealt with the question of generation classification within the BE and distinguished between three and four generations, respectively. A first generation, whose initial appointment took place before 1955/60, to whose representatives he counted among others Friedrich Feld (1887–1945), Friedrich Schlieper (1898–1981) and Karl Abraham (1904–1990); a second generation from about 1955/60 with e.g. Herwig Blankertz (1927–1983), Lothar Reetz (1931–2016) and Frank Achtenha-

gen (1939) and a third generation since 1985/90 with Jürgen van Buer (1949), Detlef Sembill (1950) and Tade Tramm (1953). With regard to the fourth generation, Zabeck merely noted that this will follow (see also Zabeck, 2009a, pp. 681–717; 2009b).

Against the background of Zabeck's generational classification, we have based our analyses on a (preliminary) generational span of 30 years²⁴, which corresponds to different expansion phases of the BE (see Figure 5). This makes it possible to carry out the following analyses within the first three generations:

- Generation 1: Initial appointment 1923–1953
- Generation 2: Initial appointment 1954–1984
- Generation 3: Initial appointment 1985–2015
- Generation 4: Initial appointment after 2016

In this respect, the research question, we are looking at here, can be concretised as follows:

- (F1) From what generation onwards can BE be described as an established science or (partial-)discipline of educational science (in the sense of Clark, 1972, 1974)?

24 This classification is to be regarded as an attempt in creating meaningful grouping, periodisation or processualisation, which is not only debatable from the perspective of social science research, but also from the historian's point of view, as he stands methodically on clay feet like all process-contemplating interpretations of history and must first prove to be able to reach a consensus through further investigations (Schulze, 2002, p. 31). Nevertheless, it offers the advantage of systematisation. We also regard the generation classification as provisional, since the development of a suitable network-analytical method for the empirical foundation of the generation classification or grouping is still pending. We will address this problem in a following article.

B. RESEARCH DESIGN

Clark's model focuses on the quantitative development of a discipline, its social network and the ability to self-recruit. Based on the research question (F1) and against the background of the Clark stage model (1972, 1974), the following four hypotheses can be derived, which are then to be examined over the generations G1, G2 and G3 (cf. chapter 3):

- (H1) In the progressing establishment process, the number of BE professors increases.
- (H2) In the progressing establishment process, the initial appointment age of the BE professors decreases.
- (H3) In the progressing establishment process, the number of qualification and/or employment relationships between the BE professors increases.
- (H4) In the progressing establishment process, the relative share of non-discipline professors who are in qualification and/or employment relationships with professors of the BE decreases.

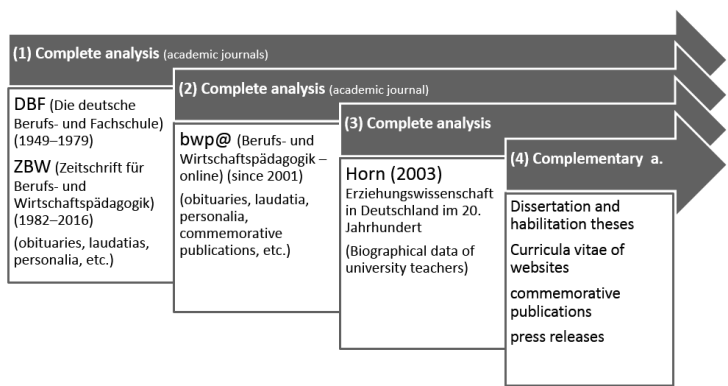
The first hypothesis (H1) states that the number of BE professors is increasing in the ongoing establishment process. Clark (1972, pp. 665–666) speaks in this context of the increase in scientific research and teaching positions as a basis for the creation of a regular training program. The second hypothesis (H2) focuses on the initial appointment age of professors and contains the thesis that this decreases in the course of the estab-

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lishment process due to the creation of a regular training programme. We can only speak of an 'established science' within the meaning of Clark (1972, p. 662) if the junior staff of the relevant discipline can be recruited predominantly from the specially developed regular training programmes. The third hypothesis (H₃) finally refers to the increase in the number of qualifications and/or employment relationships between professors and their academic teachers. These relationships may consist of doctoral, habilitation and/or employment relationships. In this context, Clark (1972, p. 665) speaks of an advanced research training programme or stable self-recruitment. The fourth and final hypothesis (H₄) also formulates a connection between the establishment process and the relative share of non-disciplinary professors who are in qualification and/or employment relationships with professors of the BE. The decline in the qualification and/or employment relationships with non-disciplinary professors is also an indication of an advanced research training programme and stable self-recruitment. In order to verify the hypotheses (H₁-H₄) and to (preliminary) answer the research question (F₁), a collective-biographical data corpus (Schröder, 2011) was created, in which data on the origin of the professors, on potential vocational training and professional activity, on studies, if applicable on clerkship, on academic qualifications and employment relationships and activities as well as on professional scientific employment (including appointments and denominations) are included. The following data collection strategy was used to establish the data set (see Figure 2). It is characterized by a complete analysis of easily accessible fundamental business educational sources with extensive biographical information on professors of the discipline. Finally, missings

were determined and complemented by a complementary analysis as far as possible.

Figure 2:
Data collection strategy, Source: Own presentation

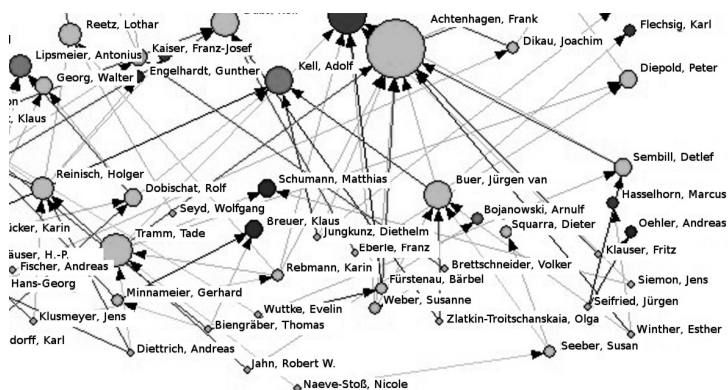


The professors (N=175) were identified on the basis of relevant and closely related denominations (e.g. ‘Wirtschaftspädagogik’ and ‘Wirtschaftsdidaktik’) as well as on the basis of qualification and working relations form the foundation of the following analyses (cf. chapter 3). For us, only the relevance of the denomination is decisive for the disciplinary affiliation in this contribution. Due to the qualification and work relationships, the data corpus contains not only professors of BE but also professors of business administration, general educational science and vocational education.

Based on this collective-biographical data set, we have created a sociomatrix. It covers the qualification and employment relationships of the professors. The relations are coded according to ‘doctorate with’, ‘habilitated with’ and ‘worked with’. With

regard to the qualification and employment relationships, we have recorded – as far as possible – all relations. By combining the types of relation, seven different characteristics are possible. The sociomatrix was then transformed into a network ($N=139$)²⁵ by means of UCINET and NetDraw (Stegbauer & Rausch, 2013) that we have arranged chronologically according to the year of initial appointment (see Figure 3).

Figure 3:
Enlarged detail of a NetDraw-plot of the network of BE professors
($N=139$),



Source: Own presentation based on the collective-biographical data set
(status: Sept. 2017)

Each network node represents a professor and each arrow or pointed edge represents a relation to an academic teacher. The colors of the nodes represent the discipline assignment based on

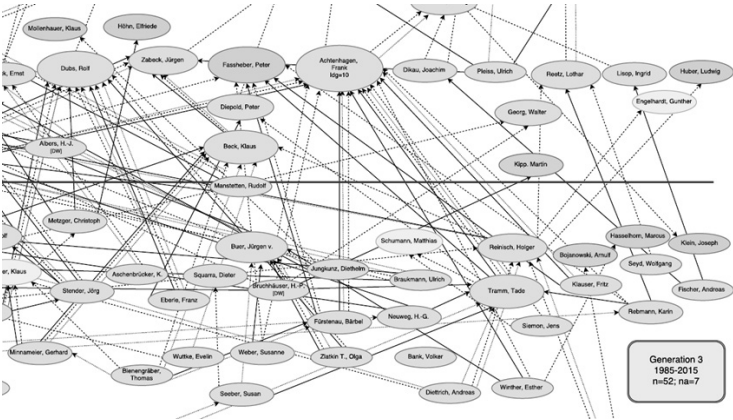
²⁵ The reduction of the population of $N=175$ of the identified professors to $N=139$ (93 professors of business education and 46 non-discipline professors) in the network results from (still) missing initial appointment data.

the denominations. The BE professors are green, for example, and the professors of vocational education are red. The colors of the edges represent the seven characteristics. For example, it becomes clear that Tade Tramm has a working, doctoral and habilitative relationship to Frank Achtenhagen (red-brown edge).

The size of the nodes represents the indegree. So the larger the node, the more connections due to employment and/or qualification relationships of subsequent professors are present at this node. It also becomes clear that this network visualisation is only to a limited extent suitable for further analyses. The first problem is the chronological arrangement after initial appointment years, which in NetDraw is only possible with considerable distortions of the time axis, rendering a visual separation by generations difficult (cf. chapter 2.1).

In addition, the coding of the relations with colours is not particularly meaningful, since compounds with a high weight, such as doctorated, habilitated and worked with, are not well visible. Therefore, we have manually converted the network into a directional graph with multiple edges by means of draw.io (see Figure 4).

Figure 4:
Excerpt of the optimised network of BE professors with draw.io (N=139),
Source: Own presentation based on the collective-biographical data set
(Status: Sept. 2017)



In this optimised form, the professors of BE are now shown in blue, the professors of vocational education are shown in red. The edges are dissolved in employment, promotion and habilitation relationships. Finely dotted edges signify work relations, coarsely dotted lines doctoral and solid edges habilitation relations. The dividing dark blue horizontal line marks the transition from the second to the third generation (cf. chapter 2).

Furthermore, we have also conducted an exemplary examination of the quality of the collective-biographical data set and the network through an interview with Frank Achtenhagen, who, at ten, has the highest indegree-value²⁶ in the network of BE pro-

26 The calculation of the indegree-values is based on the sociomatrix (status: Sept. 2017, before the validation with Frank Achtenhagen, (first) without weighting of the identified relations). This also includes relations that are not listed in our network visualizations due to missing initial appointment data.

fessors. Using all the biographical data on Frank Achtenhagen, we determined a conformity coefficient of 83.3%. With a focus on network relations, the coefficient of conformity is as high as 99.95%. These coefficients of conformity can be considered as a first indication of the quality of the data collection and the network.

3. (PRELIMINARY) RESULTS

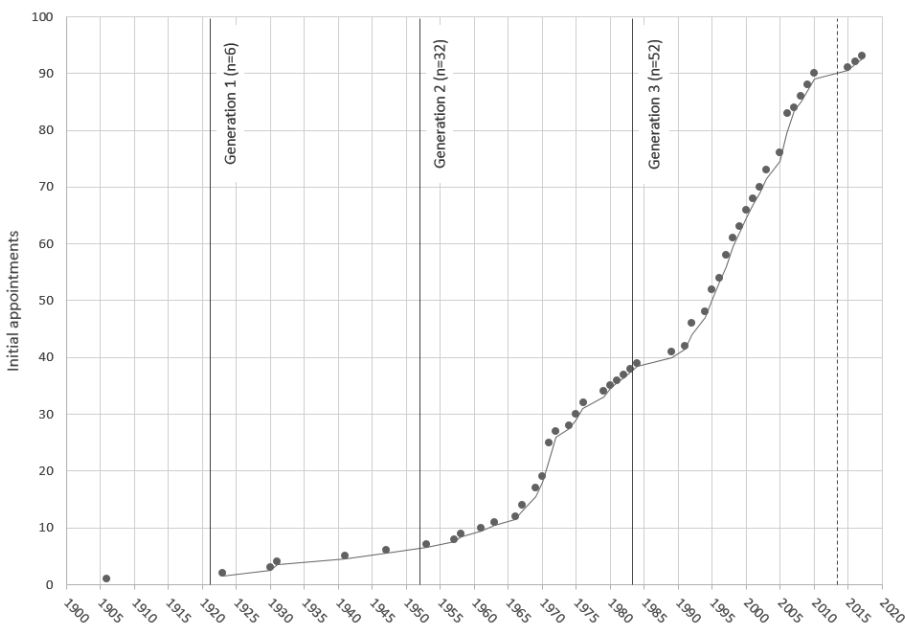
By checking the established hypotheses (H₁-H₄) (cf. chapter 2.2) in the first three generations of the BE (G₁, G₂ and G₃) (cf. chapter 2.1) it is now possible to limit the period of establishment of the BE and thus to answer the research question (F₁) provisionally – among other things with regard to the extension and completion of the data corpus as well as the optimization of the evaluation procedures.

(H₁) In the progressing establishment process, the number of BE professors increases.

The first hypothesis can be confirmed by the increase in the number of business education professors over all three generations. In the first generation (G₁) we find six initial appointments, in G₂ 32 and in G₃ 52. According to Clark, this increase in scientific research and teaching positions can be seen as a basis for the creation of a regular training programme and thus as a precondition for the establishment of business education. However, the accelerated increase in professorships of business education in G₂ and G₃ must also be seen against the background of exogenous factors such as the expansion of education

in the 1970s and as a consequence of German reunification after 1989/90 (cf. Figure 5).

Figure 5:
Cumulative first appointments of BE professors 1906–2016 (n=93),
Source: Own presentation based on the collective-biographical data set
(status: Sept. 2017)



(H2) In the progressing establishment process, the initial appointment age of the BE professors decreases.

The age of the first appointed professors of the BE, which is still 48.9 years in the arithmetic average in G₁, falls in G₂ to 40.8 years and remains relatively stable in G₃ at 40.9 years. However, it is below the average age of the professors in educational sci-

ence 2015, which is 42.7 years (Statistisches Bundesamt, 2016, p. 184). According to Clark, this also points to the creation of a regular training programme as a basis for establishing the BE.

(H₃) In the progressing establishment process, the number of qualification and/or employment relationships between the BE professors increases.

The number of qualification and/or employment relationships that a BE professor has with subsequent professors of the BE is expressed in a network analysis via the Indegree. To check H₃ over the generations, one can use the average indegree. In G₁, this is 0.8, in G₂ it is 2.4 and 1.0 in G₃ (see Table 1).

Table 1:
Average Indegree of the Professors of BE (by generations),
Source: Collective-biographical data set (status: Sept. 2017)

Generation	Number of BE professors	Sum Indegree	Average Indegree
G1 (1923–1953)	6	5	0,8
G2 (1954–1984)	32	78	2,4
G3 (1985–2015)	52	52	1,0

The (still) lower average indegree in G₃ compared to G₂ is due to the fact that the recruitment process of G₄ (from 2016 onwards) has only just begun as a result of the qualification performance of G₃. Therefore, in the further course of the (self-)recruitment process, a significant increase in the index values of G₃’s continu-

ing active BE professors can be expected. Only more extensive comparative studies allow to determine from which value on a stable self-recruitment or a reference to a regular or advanced (research) training programme can be ascertain.

(H4) In the progressing establishment process, the relative share of non-discipline professors who are in qualification and/or employment relationships with professors of the BE decreases.

The fourth and final hypothesis also formulates a connection between the establishment process and the relative proportion of non-disciplin professors who are in qualification and/or employment relationships with professors of the BE. The decline in the number of qualifications and/or employment relationships with non-disciplin professors is also an indication of an advanced research training programme and stable self-recruitment and can be confirmed from G1 to G2 and from G2 to G3 (see Table 2).

Table 2:
Relative share of non-disciplin professors (by generations),
Source: Collective-biographical data set (status: Sept. 2017)

Generation	Number of BE professors	Number of non-disciplin professors	Relative share of non-disciplin professors
G1 (1923–1953)	6	15	71.4%
G2 (1954–1984)	32	22	40.7%
G3 (1985–2015)	52	7	11.9%

However, the relative proportion of non-discipline professors who are in qualification and/or work relations with professors of the BE still seems to be quite high in G2 at 40.7%. Against this background and in view of the lack of comparative and/or alternative measures, we do not yet regard the BE in G2 as an established science or (partial-)discipline of education science.

On the basis of the hypothesis test (H1-H4) over the three generations (G1, G2 and G3) of the BE, the period during which the BE is established as a science or (partial-)discipline of educational science can be delimited as follows (see Table 3).

Table 3:
Limitation of the establishment period of the BE (over generations),
Source: Collective-biographical data set (status: Sept. 2017)

Hypotheses	G1 (1923–1953)	G2 (1954–1984)	G3 (1985–2015)
(H1) In the progressing establishment process, the number of BE professors increases.	X	✓	✓
(H2) In the progressing establishment process, the initial appointment age of the BE professors decreases.	X	✓	(✓) rel. stable
(H3) In the progressing establishment process, the number of qualification and/or employment relationships between the BE professors increases.	X	✓	(✓) expectable
(H4) In the progressing establishment process, the relative share of non-discipline professors who are in qualification and/or employment relationships with professors of the BE decreases.	X	X	✓

Starting from Table 3, the establishment of the BE can be located at the transition from G₂ to G₃ – i.e. around 1985. In G₃, the BE can therefore be described as an established science or educational science (partial-)discipline within the frame of the Clark model. This largely corresponds to Reinisch's assessment (cf. chapter 2.1). However, it should be noted critically that this first limitation of the establishment period of the BE or the answering of F₁ should be regarded as provisional in view of the underlying generational classification, missing and/or incomplete data in the data corpus and more comprehensive studies (e.g. in conjunction with publication analyses). In this respect, we are only at the beginning of our research work and may have to revise or specify this finding in the future.

4. CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

Based on the assessment of our findings and against the background of other scientometric (or qualitative) research perspectives, which allow conclusions on the development and internal and external constitution of the vocational and business education and neighboring (partial- and/or sub-)disciplines of the educational sciences to be drawn, our focus is currently on the creation of a collective-biographical data corpus of the vocational and business education in the form of an SQL database. Among other things, this will enable the dynamic acquisition of collective-biographical data and dynamic network visualisation. In addition, the relational database solution is intended to provide interfaces to existing or planned bibliometric and/or cur-

ricular databases of scientists of the Subdivision Methodology of Educational Research of the German Educational Research Association (GERA). The first cooperation relationships beyond educational scientific (partial- and/or sub-)disciplinary boundaries have already been initiated. On this basis, further communication relationships, e.g. based on publication networks, can be investigated in the future. In addition, the problem of generation classification and the question of (partial- and/or sub-) discipline affiliation will be critically examined. We will discuss our efforts to develop a suitable network-analytical method for the empirical foundation of the generational classification or for a different grouping or periodisation in a following article. The question of (partial- and/or sub-) discipline affiliation, which we have so far solved through the relevance of the denominations of the professorships, will also be addressed in the future by further characteristics that are decisive for the self-drafting of the discipline-specific identity; for example, the degree (here e.g. diploma as a qualified teacher of business education), the doctoral and postdoctoral subject and the teaching qualification (*venia legendi*) (see also Keiner & Schaufler, 2014, p. 278).

Furthermore, if we want to investigate questions of the internal and external constitution of the vocational and business education and its relations and demarcation lines to neighbouring (partial- and/or sub-)disciplines against the background of the ideal-typical differentiation of scientific disciplines of Ambrose (2010) as well as in particular 'paradigmatic' and epistemological positions or schools and/or sub-groups on the basis of complex network analyses, however, we must first carry the foundation and in this respect we stick with Kuhn (1970, pp. 179-180): 'Both normal science and revolutions are, however, communi-

ty-based activities. To discover and analyze them, one must first unravel the changing community structure of the sciences over time. A paradigm governs, in the first instance, not a subject matter but rather a group of practitioners. Any study of paradigm-directed or of paradigm-shattering research must begin by locating the responsible group or groups’.

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Green Technology in Development Country, Community Awareness and the Implementation in TVET

Arasinah Kamis*, Bushra Limuna Ismail
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Abstract: Studies show that the current state of global warming and phase of climate change are caused by greenhouse gases. There are a handful of people who are not aware of the environmental issues and take it easy in reducing greenhouse gas emissions as a result of the use of fossil fuels. Consequently, this concept paper is initiated to examine the Government's policies and roles in the development and implementation of green technologies as well as community practices in ensuring that the goal of reducing greenhouse gases is met. Obviously, a lot of research needs to be done in promoting the availability of new renewable energy resources as an alternative to the conventional sources; switching to renewable technology is necessary to meet the goals of the National Green Technology Policy. Therefore, green technology will contribute to sustainable development in terms of the environment, economy and social activities. Green technology also need to be integrated into the TVET curricu-

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lum to produce students that are not only competent technically but have the responsibility towards the environment.

Keywords: Green Technology, Government's Role, Green Practices, Renewable Energy

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1. INTRODUCTION

Green technology is known as environmental technology or clean technology. It is the technology that is environmental friendly and

aim to conserve resources and environment. Green technology is the application of one or more of environmental science, green chemistry, environmental monitoring and electronic devices to monitor, model and conserve the natural environment and resources, and to curb the negative impacts of human involvement (Ghanshyam Das Soni, 2015). Green technology also is an environmental science that can be applied to conserve the resources and preserve the nature, and to mitigate or reverse the negative impacts of human activities on the environment. It is a low-carbon technology and is more environmentally friendly than the existing technologies. When we apply green technology, we use natural resources such as solar energy or wind power, and water to produce a product. As such, any technology that contributes to the reduction of greenhouse gas emissions should be continued. On the other hand, any technology used to develop products and services, that produces high greenhouse gas emissions, should be reduced (Lim & Wu, 2016). This can be carried out in stages, through awareness campaign in its initial stage and further through statutory enforcement. Application of Green Technology is in line with the concept of sustainable development, the organizing principle that meets the current human goal without affecting the needs of the future generations (Monu Bhardwaj & Neelam, 2015; Azmi, Musa, Abdullah & Fam, 2017).

GREEN TECHNOLOGY IN THE NATIONAL ADMINISTRATION

The Ministry of Energy, Green Technology and Water (KeTHHA) Malaysia was formed on 9 April 2009 to replace the Ministry of Energy, Water and Communications. This is

the main government-agency responsible for resolving the environmental issues, especially the phenomenon of global climate change (Karmilah & Jamilah, 2014). The green technology should be a driver to accelerate the national economy and promote sustainable development. The National Green Technology policy has been based on four pillars which are energy, economy, environment and social (KeTTHA, 2009).

2. FOUR PILLARS OF GREEN TECHNOLOGY POLICY

In applying green technology, the highest priority is to improve the quality of life of people if by preserving a quality sustainable environmental. Air pollution, contaminated water, noise and so on will affect the quality of life of people if these environmental problems are not solved or mitigated. When we use green technology, the negative impacts of production and human activities on the environment are minimal. Green technology also has a great potential in driving the national development, economic growth in the long term and impact of a transition to low-carbon energy (Fankhauser & Jotzo, 2018; Monu Bhardwaj & Neelam, 2015). An industry that uses green technology to develop products can provide job opportunities for local the communities. Industrialist and business people can also explore the option of exporting 'green' products produced (Kondawar & Deshmukh, 2018; Junaedi, 2005). The market for green technology and products is huge, especially in the renewable energy sector. The Government needs to provide a suitable platform for promoting green technology. The private sector, professionals and researchers must work together to create and commercialise

green technology (McLauchlan & Mehrubeoglu, 2010). Therefore, renewable energy sources and green practices can mitigate harmful effect on environmental sustainability (Khan, Zhang, Anees, Golpîra, Lahmar & Qianli, 2018). (Figure 1)

1. ENERGY

Renewable energy has grown steadily in the worldwide, Pacific and Asia. It's becoming producing lesser air pollution, cheaper and also emerging related innovations continue to help implement renewable energy projects (Maclean, Jagannathan & Panth, 2018). Seek to attain energy independence and promote efficient utilization. By using renewable energy sources like solar energy, we also reduce our dependence on fossil fuel gas and oil reserves, which are becoming more expensive and difficult to find. It also reduces our dependence on imported fossil fuels, improving our energy security (Bergthorson, 2018; Fankhauser & Jotzo, 2018). However, the amount of fossil fuel and non-green energy sources create significant harmful effect on the environmental sustainability and also have negative effect on economic growth (Maclean, Jagannathan & Panth, 2018; Khan et al., 2018; Bergthorson, 2018).

2. ENVIRONMENT

Conserve and minimize the impact on the environment by protecting the environment, whether that is recycling carries of clean energy, reducing our power consumption by switching electronic devices off rather than using standby, by walking short journeys instead of taking the bus. The primary con-

cern of the future of humanity. It also concerns how technology will drive the greener future protecting the environment of the future from potential damage that technological advances could potentially bring (Bergthorson, 2018).

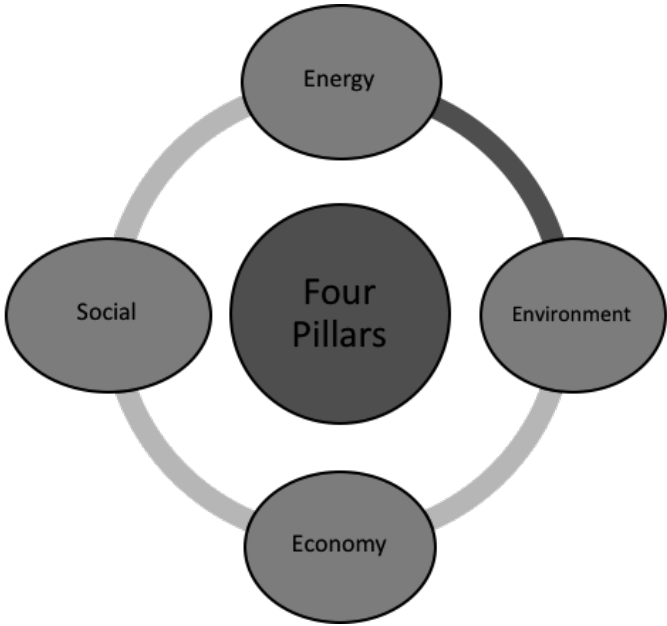
3. ECONOMY

Enhance the national economic development through the use of technology and also providing incentives for businesses and other organizations to adhere to sustainability guidelines beyond their normal legislative requirements. Economic development is about giving people what they want without compromising quality of life, especially in the developing world, and reducing the financial burden and “red tape” of doing the right thing.

4. SOCIAL

Improving the quality of life for all. Most importantly is awareness of and legislation protection of the health of people from pollution and other harmful activities of business and other organizations. It is also about maintaining access to basic resources without compromising the quality of life.

Figure 1.
Four Pillar of the National Green Technology Policy



(Source: KETTHA, 2009)

3. THE IMPORTANT OF GREEN PRACTISE IN LIFE

Green Technology is environmentally friendly and capable of driving a low-carbon economy; it reduces emissions of carbon gases into the air that cause world weather conditions. However, carbon emission damages fauna and flora, and reduces economic growth (Khan et al., 2018). An example of the phenomenon of global weather change is the extreme temperatures we are experiencing today such as heat-waves. In addition, global

weather changes also cause natural catastrophes and other environmental damages such as typhoons, ice-rises in the North and South Poles, rising levels of seawater and temperatures and extinction of flora and fauna species, and etc. Therefore, mitigating the adverse effect of global climate change has become one of the top priorities of today's world community (Fankhauser & Jotzo, 2018). The natural process of global weather change cannot be prevented; however, concerted efforts of the world community can slow it down.

The Green Technology applications are one of the steps taken to slow down the process of global weather change. Consumers are among the biggest contributors to greenhouse gas emissions, through daily activities and the choices we make; for example, the types of cars we drive, electricity consumption, and usage of chemicals such as insecticides (Azmi et al., 2017; Mohareb, Heller & Guthrie, 2018). Consequently, to be more environmentally friendly, we should consider green technology applications and practices in carrying out daily activities, such as the use of energy-efficient electrical appliances, the use of public vehicles or alternative fuels, saving water, etc. Although green practices are not a common habit among some of us today, we have to change our mindset, so that we will still be able to enjoy the quality of life today in the long run (Atzori, Shapoval & Murphy, 2018; Kamis, Alwi, Ismail, Zakaria, & Yunus, 2017a). We must also be aware that our choices made today will determine the future of our children; adopting some small green practices, such as recycling waste, using energy-efficient equipment and saving elect and water savings electricity and water will go a long way in protecting the environment for the future generations (Cohen, Lobel & Perakis, 2015).

Green practices can lead to the use of green technology, which is strongly encouraged to reduce the rate of increase in energy consumption and at the same time increase the economic development of a country (Rusli & Ahmad, 2018). This is because everyone is a consumer, and they are the biggest contributors to greenhouse gas emissions through daily activities and choices made (Porter, Reay, Bomberg & Higgins, 2018). Among the things that individuals can do are using or recycling used items, reducing garbage disposal, prioritising eco-friendly products or services, using public transport services and use prudent use of treated water (Kondawar & Deshmukh, 2018; Bisoyi & Das, 2018; Lin, 2013).

Consumers should also make a conscious choice to purchase energy-efficient types of electrical appliances. Energy-efficient lamps should always be the lighting equipment for the home. All such actions, though they look small will result in energy saving. The price of energy-efficient equipment may be slightly more expensive than regular items, but it saves energy and produce less harmful effect on the environment. The important thing is to start with easy and cheaper steps first and gradually develop the culture of green living (Sabri & Yong, 2006). Parents should show good examples to their children so that they will be encouraged to go green and love the Earth. Actually, appropriate lifestyle changes and right mindset shifting will automatically move a person towards green behaviour and applying green technology. The small changes we make in the right direction today will yield a huge positive impact in the future.

We must adopt as many green practices as possible, starting with the simple things we can do. Basically, green practices refers to a way of life that contributes towards maintaining the natu-

ral ecological balance in the environment, and preserving the planet and its natural systems and resources. It means contributing towards maintaining the natural ecological balance in the environment, and preserving the planet and its natural systems and resources (Rusli & Ahmad, 2018). It also means taking steps, whether big or small, to minimize the harm you do to the environment (including the carbon footprints you leave behind), as a result of inhabiting this planet (Karmilah & Jamilah, 2011). There are many things you can do to live a green life, amongst which you can help by:

3.1 REDUCE POLLUTION

In our day-to-day activities, we actually release substantial amount of toxic substances into the environment. Think about the shampoo, soap and cleaning detergent that you use, think about the fast-food lunch you had, think about the car that you drive to work, or even the bus or cab that you take to your office (Kondawar & Deshmukh, 2018). In our modern day life, it may be hard to leave zero trace of toxic substances, or create zero pollution in our activities. So many of the things that we use on a daily basis contain some form of chemicals, or are produced through the use of some chemicals. Despite the pollution caused, we would still need to travel to work, whether by private or public transport. And we definitely need to consume food. Consider switching to more natural cleaners and personal products, such as natural detergents, or organic detergents, as well as organic shampoos, cosmetics and lotions (Kondawar & Deshmukh, 2018; Porter et al., 2018). Switch to organically grown food if you can. Organically grown food is grown with-

out the use of synthetic pesticides and fertilizers that would harm the environment, as well as hormones or genetic reengineering. By taking public transport (such as buses and trains), you are actually helping to reduce the number of automobiles on this earth, and hence the amount of air pollution produced by these vehicles (Azarpira, Dhumal, & Pondhe, 2014).

3.2 CONSERVE RESOURCES

As the human population continues to grow and technological advancements (eg. mass production, transportation) help make more material goods more readily available to people all over the world, we consume more and more natural resources. This rate of consumption is especially apparent in developed countries. More and more trees are cut down to produce more and more paper for the growing number of offices worldwide. More oil, coal and other natural fuels are extracted from the earth to drive our factory machineries, our automobiles (including our airplanes) and our homes. However, the world's supplies of oil and coal will not last forever, and our use of these fuels is contributing to polluted air, acid rain and global warming. Bergthorson (2018) suggest to recycled using zero-carbon electrolysis powered by clean energy and solar fuels or electrofuels. With deforestation and fewer trees on earth, there are fewer plants to absorb excess carbon dioxide from the atmosphere, accelerating the impact of global warming. In turn, global warming worldwide have led to climate changes, and phenomenon such as serious flooding and drying up of originally forested land, leading to further loss of precious forests, and destruction of habitat for more plant and animal species (Fankhauser

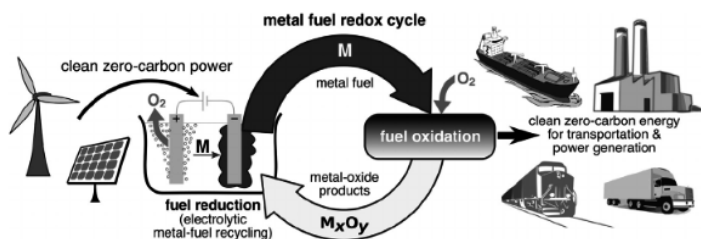
& Jotzo, 2018; Amaruni, Arasinah, Faizal & Ridzwan, 2016). Over-fishing have almost wiped out some fish populations in the waters, and reduced the number of fishes in the ocean significantly. While the reduction in certain predator fish species may lead to the proliferation of other fish species temporarily, nevertheless the upset to the marine ecosystem has eventually led to the destruction of the natural reefs completely. In the process, more marine species are lost. At this rate, the earth would not be able to sustain life (including ours) on this planet for long.

3.3 CONSERVE ENERGY

Another aspect of what does going green mean in practice is to conserve energy. As with the earth's resources, the sources of energy (in the form of oil, coal, natural gas, etc.) on earth are currently finite. While humans have started exploring other sources of "sustainable energy", such as palm oil, there are inherent environmental problems with the cultivation of some of these energy sources (Azarpira et al., 2014). For other infinite and green sources of energy available (e.g. solar energy), there are currently still some difficulties in harnessing these potential sources. Until the day the human population is able to effectively make use of the infinite, sustainable, and green sources of energy available to us, it is important that we conserve our energy resources. Saving energy also means less pollution. The extraction of energy producing materials such as oil and coal from the earth generates substantial pollution. In turn, the use of these energy materials in driving our power stations, factories and automobiles produces large amounts of pollution and contributes in large ways to global warming. So the less

energy we use, the less pollution we create. Other research by Lee, Mohd Zain and Lai (2017) also show that the energy generated from the living plants are able to produce energy and it should be fully utilized as part of the energy resources to generate energy. Meanwhile, Bergthorson (2018) and Wiinikka, Vikström, Wennebro, Toth and Sepman (2018) also introduced the concept of low-carbon metal fuel cycle, which metals are utilized as recyclable zero carbon electro fuels is illustrated in Figure 2. At the same time inspires their use as recyclable electrofuels.

Figure 2.
Low-carbon metal-fuel cycle for global trade in clean energy for power generation and motive power. Reprinted from Bergthorson (2018)



3.4 REDUCE CONSUMPTION AND WASTE

Another important aspect of what does going green mean in practice is to reduce consumption and waste. The principle of Reduce Reuse Recycle cannot be over-emphasized. As we reduce our consumption (especially of goods), the world would have less need for energy and resources (especially raw materials), and in the process produce less pollution (whether via the manufacturing industries, or the disposal of waste created through consumption).

As we reduce our waste, we would need to use less energy and resources for handling our unwanted waste. There would be less pollution arising from the landfills and the incinerators. Reused helps us to reduce our consumption of new materials, as well as help to reduce the waste that we create as an entire population (Bisoyi & Das, 2018; Anwar, Ghaffar, Razzaq & Bibi, 2018). Recycled also allows us to reuse the materials in unwanted items to make new items. In this way, valuable resources that would otherwise contribute to pollution (e.g. non-biodegradable materials or materials that release harmful substances when burnt) can be diverted away from landfills and incinerators and given a new lease of life in new products (KETTHA, 2009).

3.5 PROTECT THE EARTH'S ECOLOGICAL BALANCE

The earth's ecological balance refers to the equilibrium formed as a result of the harmonious co-existence of living organisms, including plants, animals and man, on this planet. Should the balance of this equilibrium tip in any direction, all the organisms involved would be adversely impacted. In the process, we have striped other creatures of their habitats and even lives. With the destruction of forests, we are also hindering the earth's ability to clean itself of excessive pollutants and carbon dioxide (which contributes to global warming), resulting in a less ideal climate for both ourselves and other living organisms (Fankhauser & Jotzo, 2018; Shiva, 2016; Ibrahim et al., 2007). To feed our increasing population, we have been stretching the earth beyond its limits, through activities such as over-farming and over-fishing. Unrelenting, we continue to seek to challenge these limits, through inventing new ways of producing more for

our greedy species. We introduced the use of man-made chemical fertilizers, artificial hormonal injection in farm animals, and genetic engineering.

Keep an organic garden, or even start an organic farm, and help reintroduce more life (beyond humans and our needs) on this planet. Therefore, research by Sharma and Garg (2018) and Huang et al., (2018) suggested vermicomposting method as the most suitable green technologies for the organic waste management. This method diverting energy of waste towards agri-production and soil conservation. It is also organic manure used as an alternative to chemical fertilizers since it favours microbial biodiversity and improves soil structure and fertility along with crop production. Use organic products instead of products that release harmful chemicals into the environment (Kondawar & Deshmukh, 2018). Donate regularly to forest or wildlife conservation efforts. Or better still, protect a piece of forest land under your name. Respect the lives of other living creatures (plants and animals alike, not just your cute pet dog or cat), and also educate your kids on the importance of doing so. In this way, you would have built the foundations for a more environmentally-conscious generation. All these efforts will contribute now and in the long run to keeping this earth sustainable (Atzori, Shapoval & Murphy, 2018; Jain & D'lima, 2018; Shiva, 2016).

4. AWARENESS MEASURES TO COMMUNITY

The Ministry has initiated awareness programmes related to Energy Efficiency (EE) and Renewable Energy (RE). EE and RE is one of the green technology branches since the year 2000

through the establishment of Centre for Education, Training and Research in Renewable Energy and Energy Efficiency (CETREE) by Universiti Sains Malaysia (Farahwahida, Arieff, Salwa, Siti Hajar, & Teh Ubaidah, 2013). The targeted audience of these awareness programmes are professionals, school students, students of institutions of higher learning and the general public in Malaysia. These are some of the programs that CETREE has implemented are the Energy & Environment Conservation Campaign and Energy Efficiency Campaign at Universiti Sains Malaysia, Eureka Competition, Solar Car and Solar Kitchen, National Science and Technology Education Carnival and a few other. Apart from that, CETREE has also developed a module of Renewable Energy and Energy Efficiency for the national Primary School Curriculum. The teaching of this new EE and RE module throughout Malaysia will increase the green awareness among early school students in the area of Renewable Energy and Energy Efficiency (Ibrahim et al., 2007; Amaruni et al., 2016).

Additionally, the Ministry has also implemented an annual programme called National Energy Month; the primary aims are to raise awareness on renewable energy and promote energy efficient practices among the public and the private sector (Hashim & Ho, 2011) Here are some example of the activities carried out during the National Energy Month: conducting energy efficiency talks, publishing home energy efficiency guides, publishing series of articles in newspapers and using mass media to promote energy efficiency in the future The Ministry will implement green technology campaigns in collaboration with various related parties including the public and ministries, government departments, non-governmental organisations (NGOs) and

other relevant agencies. The main objectives is to educate and enhance awareness and knowledge of all parties, regarding the importance of green technology in the daily life and its impact on the environment. This is to ensure that other programmes implemented by the Government in promoting and developing the local green technologies can be effective and appreciated by all levels of the society (Monu Bhardwaj, 2015).

The Government's efforts to implement green technology needs to be viewed from two aspects. The first is the aspect of innovation, which is the effort to create or develop green technology. It does not necessarily mean to create something complex. It could be producing simple and practical products that are environmentally friendly and practical for our country (Kondawar & Deshmukh, 2018). It is important to encourage students from the school to create something albeit small and simple. At higher levels, our researchers can craft new technologies that can produce products without wasting resources such as energy and water. The new design should be practical and can be commercialized for local use and for export purposes. The new green technology must be applicable either in carrying out a work process or activities of daily life. Creating awareness of green technology and its practice to employees can increase knowledge and reduce the negative impact on the environment (Fadhlur & Haslinda, 2018; Azmi et al., 2017).

An integrated approach should takes into consideration on the environmental education and training for greening education on how the range of abilities can be tended to at various levels of training education. This requires an effective green framework, policy and practices for creating a highly skilled and creative workforce and talent pool that are critical to achieving

sustainable inclusive economic development in the 21st century (Bushra, Arasinah, Che Ghani, Tee Zee & Md. Bekri, 2016). In this global economic challenges, people should have the awareness of the importance of sustainability and the need for green skills. This is in line with technical and vocational education that is needed to produce high-skilled labour who know the importance of sustainable development. Technical Vocational Education and Training (TVET) sector needs to take advantage of opportunities and worker productivity in the economy as well as building competitiveness in facing the challenges of change and development. Due to that, there is a clear evidence to show that TVET has assumed a key role in upgrading green improvement (Kamis et al., 2017a; Kamis, Mustapha, Wahab & Ismail, 2016; Ramlee, 2015).

5. IMPLEMENTATION OF GREEN TECHNOLOGIES IN THE SUSTAINABLE DEVELOPMENT OF TVET

As indicated in the 11th Malaysia Plan which is to produce and develop the human capital that can spur economic growth in the future with the awareness of the importance of preserving the environment. The 11th Malaysia Plan in the fifth strategy recorded that the fertilizing of green technology culture among students is a necessary beginning of each level through the development of an effective system of syllabus. Therefore, it is very convenient for green technology and green skills to be fostered from an early stage in primary school education before students into secondary schools (Kamis, Rus, Rahim, Yunus, Zakaria, & Affandi, 2017b). Meanwhile, the government's aim is not to only produce highly skilled human capital in green job

but also able to maintain sustainable growth and green technology (Scully-Russ, 2018; Strietska-Ilina, Hofmann, Haro & Jeon, 2011; Mass, Moss, Hopkins & Ross, 2010). The skills for sustainability, green skills, and skills learned via TVET for sustainability are different terms used in implementation sustainability education in TVET (Chinedu, Mohamed & Azlinda, 2017). The TVET play an important role in the success of transitioning the economy to the development of green economy and clean environment conducive for the overall economic growth (Kamis et al., 2016; Ramlee, 2015; Minos, Butzlaff, Demmler & Rischke, 2016). Through a greater sustainability-related curriculum, plays a crucial role in educating students to be aware about the importance of conserving the environment for the wellbeing. Therefore, it is suitable to introduce green technologies and green skills in primary school, before they move on to secondary schools. When these students, instilled with green elements, progress to a higher level of education, they will be able to apply their skills and knowledge before taking into account the aspects of green growth and will produce a green product (Musyimi, 2018; Kamis et al., 2017a; Coljin, 2014; KPM, 2011; Fien & Guevara, 2013). Producing and designing simple products, environmentally friendly, recyclability of the project materials and cost effectiveness of materials used (Musyimi, 2018). TVET Institutions should implement energy plan and recycle most project materials to earn some income to enhance greening the institutions.

Meanwhile, there was insufficient integrated sustainable development training, lesser promotion of technical skills for a greener economy and inadequate curriculum development and implementation strategies. TVET should therefore integrate

sustainable development into training and enhance policy coherence and coordinated implementation of education and training (Were & Ahmed, 2018). However, Chinedu, Mohamed, Ajah, and Tukur, (2018); Chinedu et al., (2017) in their study stated that the lack of sustainability integration across TVET programs is worrisome, primarily because all programs to provide education and training to skilled and semi-skilled workforce. As in the strategic plan of the first transformation of TVET to provide vocational education curriculum that can produce skilled human capital to work and is willing to pursue higher education. Thus, transformation of TVET curriculum should be carried out (Pavlova & Huang, 2013).

6. CONCLUSIONS

The Government has drastically changed its policies in the development of renewable energy and industrial growth associated with green technology. Many outsiders have also made green technology the basis of sustainable development and sustainable use of disposable energy. Various campaign or awareness programmes should be conducted to raise the public awareness on the importance of green technology. Education is also very important and can do its part by providing new courses and training programmes in green development. Green technology elements should be incorporated into the curricula of all educational institutions, TVET, schools of all levels- training colleges and universities. Integrating sustainability education into the TVET curriculum, particularly the green technology element, will benefit mankind and the environment, create awareness among the young generation regarding the importance of nur-

turing the environment for the benefit and wellbeing of everyone. In conclusion, TVET institutions that adopt green technology and sustainable development elements in the courses will produce a labor force that is competent and able to contribute to the protection of the environment in the long term.

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Section II:

Language and Social Cohesion Issues

Is Language in Vocational Education and Training Preparation Really the Warp and the Woof? A German Perspective

Nina-Madeleine Peitz*

Abstract: German language competence levels are far too low within the group of young adults during their vocational training phases having implications both on their professional future but also on personal success in life. Training Preparation in the German Vocational Education system prepares students on their way from school to work being faced with their increasing diverse backgrounds with respect to mother language and German language abilities. Professional teachers must deal with the challenge of linguistic diversity during subject lessons. Students' language deficiencies lead to barriers of understanding on both sides.

The project "Inclusive Qualification Modules (QBI)" connects to these challenges as it develops, tests and evaluates qualification modules in four German vocational schools. Considering the project's major aim of inclusion and integration, results emphasize the significant role language competence plays and furthermore teachers' awareness for language in this special target group. Activities of analysis, development, implementation and evaluation are connected in a circular design-based research process.

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The paper focuses on the final step of the project – the critical analysis and evaluation of the implementation phase of the design with the aim of establishing future theories regarding the design principles in the four case studies. Systematic results are based on group interviews with teachers, curricular analysis, students' questionnaires or students' documents.

Keywords: Professional Language Competence, Training Preparation, Students' Linguistic Needs, Language in Vocational Training

1. INTRODUCTION – TEACHING INTEGRATED LANGUAGE PROMOTION WITHIN SUBJECT LESSONS AS A CHALLENGE IN VOCATIONAL TRAINING PREPARATION (VTP)

1.1 NEED FOR TEACHER SUPPORT SYSTEM IN VTP REGARDING GERMAN LANGUAGE PROMOTION

German language competence levels are far too low within the group of young adults during their vocational training phases having implications both on their professional future but also on personal success in life. Vocational Training Preparation (“Ausbildungsvorbereitung”) in the German vocational education system prepares students on their way from school to work being faced with their increasing diverse backgrounds with respect to mother language or German language abilities. Professional teachers must deal with the challenge of linguistic diversity during subject lessons. Students’ language deficiencies lead to barriers of understanding on both the student and the teacher side.

The capacity of knowing and applying the official language of the country you are living and working in is essential. A proper utilization of the specific language is the solution to a vast variety of problems in the world or at least it is the key to prevent a high amount of conflicts. The importance of language, in particular with respect to the individual's profession is not new in research. But in recent years, it has indeed reached a higher relevance within the European societies. Young individuals with diverse backgrounds enter in our educational and vocational systems, trying to get by and fit in. All of them should participate within the society's economic cycle. The field of diversity has been focused by business and human resource education science, and in light of the recent flows of refugees, a new light is shed on this field.

On the other hand, there are scientists, teachers, consultants faced with so many different languages regarding their students or clients. For these professionals, their students' native language and their awareness for the diverse languages plays an important role. Even more complex are people's diverse levels of linguistic competence in the official language of the specific country, in this case, the German language. This is the macro-economic-level perspective, where we take a look at the society and economy and its future development as a whole, and where numbers provide us with exact information. This is as well the level where research has brought about first results.

With respect to integrated language promotion within subject lessons in educational institutions and companies, which shall be defined as the meso-level, as well as individuals, hereinafter referred to as the aggregated micro-level, there is a big research desideratum. "International evidence indicates that

school systems need to change in order to tackle early school leaving and improve social inclusion in education and society. Policy-makers and school actors require practical tools to assist them in this process, made all the more urgent by the EU2020 headline target to reduce early school leaving.” (Downes, Nairz-Wirth, & Rusinaitė 2017, p.7). The statement particularly involves the call for systematic analyses and the development of language measures and actions.

Many students in the school-to-work transition phase lack competences that would allow them to start a professional training and entering a corresponding vocational school. A large share of the lack in competences concerns language or communicative competences. There is a great need for providing support to the professionals in VET (the present paper focuses on teachers in vocational schools) dealing with an increasing number of students in the vocational training preparation (VTP) system.

Apart from native speakers in the lower performance range, the target group in the VTP is characterized by young immigrants. Flows of refugees including a high amount of young adults below 25 years have been entering the vocational school (VS) system since 2015 and need to receive education in both the German language and vocational subjects. The aim is to prepare them to become integrated into the job market as soon as possible. Following the BAMF (2017), there were 101,029 asylum applications between January and June 2017, about 75% of this amount are young adolescents under 30 years. A high amount of these will enter the VTP system between school and job. For almost all of them, German is a foreign language. In subject lessons (meaning all specialized classes *apart from German classes*), teachers often feel overburdened and unsure how

to deal with the situation. In most of the cases, it is the (German) language being the most severe problem. “A lot of teachers are involved and commit themselves to it, but they reach their limits [..]. Integrated language promotion in specialist subject lessons means a lot of work. For this, teachers just need additional competences”, states G. Siegel, teacher of one of the *welcoming classes* (Kröning 2017, p.3) and furthermore claims that “the transition represents a great difficulty, when it is expected that students make progress without special support or promotion” (Ibid., p.4). The above-described developments highlight the necessity to create suitable concepts and further developments of the transition phase between school and job.

Based on this issue, German language promotion was declared as one of the three major challenges to tackle within the project “Inclusive Qualification Modules (QBI)”²⁷.

27 The basis for the presentation in this contribution are built by contents and data developed and collected in the context of the project “QBi” (QBi – Inclusive Qualification Modules in a Dual Training Preparation, in German: “Qualifizierungsbausteine inklusiv in einer dualisierten Ausbildungsvorbereitung”, see <https://www.uni-paderborn.de/cevet/forschung/aktuelle-projekte/qbi/>) with expert teachers of four VS within a developmental as well as an implementation phase. From July 2016 to June 2018, the project was funded by the European Social Fund and was carried out in cooperation with Paderborn University, the district government of Detmold, Germany, and educational experts from the four VS in North-Rhine Westphalia (NRW), Germany. The project’s objective is, after a status-quo analysis at the VS, to jointly develop and test adaptable and practicable qualification modules (QM). These QM have been tested and are currently being analysed and evaluated. They shall finally be implemented in the VS’ curricula.

1.2 DIDACTICAL PERSPECTIVE AND OBJECTIVES OF LINGUISTICALLY-SENSITIVE TEACHING DESIGN WITHIN THE PROJECT

Considering the project's two aims of contributing to *inclusion* and *integration*, it becomes clear which significant role language competence plays since it can open the door to both. With so-called inclusive qualification modules²⁸ (QM), teachers introduce a new way of teaching in their lessons by designing learning material based on integrated language aspects such as considering complex terminology, simplifying the types of text they use in the lessons, varying the form of presentation, or offering support in writing or orally communicating by providing students with formulations.

A second important factor that was tested, analyzed and from which implications were drawn, was the teachers' awareness for language in this special target group. All is initiated by the central question on "*Why* do the students not understand what I am saying?" Questions discussed with expert teachers of the VTP course of education ("Bildungsgang") involved the following:

28 Based on their official definition, QM are "learning units [...] defined in terms of content and time developed from the content of approved training occupations" with the intention to impart the fundamentals of vocational competences (BBiG § 69 Para. 1; own translation). For a systematic overview localizing QM within the project, see Peitz & Kimmelman (2018a) or Kremer (2011).

- 1) **How** can students with lower language skills and/or low professional qualification be supported and promoted by linguistically-sensitive aspects in subject lessons?
 - Focus in the *promotion of language competences*
 - Teaching *language-learning strategies*
- 2) **How** can professional or subject-related contents be *linguistically 'relieved'* (examples are presented in Chapter 3)?
 - Simplification
 - Assistance
- 3) **How** can I as a teacher make an impact by *changing my own attitude* towards the individual student and *towards language*?

As a subsequent step, based on the outcome of what had been developed according to the questions above, a systematic analysis of the concrete exemplary methods (strategies in oral communication, learning material for students, general teacher-student interaction in these classes) shall take place.

From the teacher perspective, the first part of the project investigated whether or not language skills are essential or play only one of many roles within this context (cf. Peitz & Kimmelman 2018a). It is presented in a summarizing form in the following Table 1:

Table 1.
Results of the developmental phase in 2017 – importance and demand of language sensitivity in VTP from teacher perspective²⁹ [own representation based on Peitz & Kimmelman 2018a, pp.218–232]

	Category
1	Perception of relevance of language promotion in vocational orientation by participating teachers
2	Defining vocational literacy from the teachers’ perspective
3	Students’ language difficulties from teachers’ perspective
4	Characteristics of the target group with respect to language promotion
5	Strategies of language promotion and its implementation

Results of the data collection showed an increase with respect to the perception of the relevance of language promotion in vocational orientation by the participating teachers. The growing significance of this perception is a consequence of a collaboration between scientific consultancy (through workshops and group discussions) and teaching experts from VS. To sum up, the important role of language has found its way into the professional personnel’s mind.

Moreover, it was emphasized from the teachers’ perspective that language difficulties were significant and vary in type regarding the target group. Students are frequently not able to *understand* what they are asked to do (*type of task*). Teacher statements about students’ vocational literacy, writing skills and professional/technical terminology point to severe defi-

29 Data comes from group interviews carried out with teachers from four VS in May, 2017.

cits. Hence, there are certain characteristics of the target group that must be referred to when developing a specific integrated language promotion.

In the first phase of the project (developmental phase), it has also been found out that the overall topic of solving language problems in the context of subject lessons (direct teaching/learning at the professional content) bears a high complexity, since subject teachers are in fact experts of their subject, **but the majority does not have the knowhow on how to support students on a linguistic basis**. Often, with respect to this target group, they are neither able to understand what the students say nor can they explain subject matters in a linguistic-sensitive way that would be required in these specific situations.

This leads to the last result from the developmental phase: the multitude of phenomena on both the students' and the teacher's sides highlights a certain degree of discrepancies between these two groups.

On the basis of what was found out in the pre-study and as a consequence of categories 1–5 (Table 1), these were taken into account during the further process of the project's developmental phase and have been tested once since (autumn/winter 2017/2018). The current paper is based upon these results from our article from last year (see Peitz & Kimmelman, 2018a) and will be extended by important new aspects with respect to the experiences of and with project partners in VS during the test and implementation phase 2017/2018.

5. THEORY AND METHODS

A. GERMAN LANGUAGE PROMOTION IN THE TRANSITION SYSTEM OF VET – STYLIZED FACTS

Languages build bridges. Nevertheless, language problems do exist in a variety of forms and in all different learner groups. Where do we expose differences in the capacity to say something in a linguistically adequate way with respect to the specific occupational field or the field in which young learners look for occupational orientation? There are students in VS completing their vocational training still showing deficits with respect to language register application required at their training companies or future work places. Then, there are students who have completed their compulsory full-time schooling (10 years in Germany) but do not have a school-leaving qualification or those who were not successful in finding a vocational training position (see German school law APO-BK, 2016). Recently, also young refugees have entered VS as a transition between school and an integration into the German labor market.

All of them are united through their *lack of linguistic skills*, i.e. in the lack of verbal or written expressiveness. By dividing the causes of these deficits, one can identify shortcomings due to e.g. cognitive deficits among others or insufficient knowledge of the second language as it is the case for young adults entering the VS system as a consequence of migration flows. Hence, as summarized by Baethge & Baethge-Kinsky (2012), the target group is a group of adolescents representing a part of the society that is difficult to define and that further shows limited cognitive competences, is often without a school leaving certificate (75% in general respectively 84% regarding within the group of

migration students) and to a certain degree does not dispose of a high social integration (cf. Baethge 2014, p.23).

On the contrary, teachers must face the (linguistic) challenges that accompany the above-mentioned learner individuals. Here, the bond between teachers and students is important in a psychological way: learning a language is as well always connected with the bond to the professional that is teaching or moderating. The whole matter becomes more and more important due to the “general qualification upskilling” (Baethge 2014, p.21) signifying a further increase of cognitive parts within employment or professional activity.

There are first attempts of other researchers delivering case examples, some of them worked with young migrants and their linguistic as well as general school integration at the lower secondary level such as Gill (2015), studies by ISB (2017) or Diehl, Friedrich, & Hall (2009) regarding upper secondary level or Hunger et al. (2008) dealing with the transition system. Efung (2013) is one of the first addressing general significant language issues with respect to the upper secondary level³⁰. But there are not yet empirical studies on language-related problems and solution designs within the transition phase between primary/lower secondary level education and the vocational system. Here, the target group comprises young adults with German as their native language as well as students with German as second language, a lot of them additionally having other qualification deficits. The investigation was carried out and analyzed from the teacher perspective. Before starting to present integrated language promot-

30 In Germany, the vocational training schools technically belong to the upper secondary level.

ing methods and material for subject lessons, in the following, a short explanation will be offered in order to get a clearer view on the system in focus here.

IN THE FOCUS – VOCATIONAL TRAINING PREPARATION AS A SPECIAL FIELD OF ACTION

“At the upper secondary level (Sekundarstufe II), one can observe a stagnation with respect to linguistic competences indicating the fact that this level – within the framework of vocational education and training – is not able to succeed in compensating the language deficits that students bring along from the previous lower secondary level.” (Efing 2013, p.75).

The VTP (“Ausbildungsvorbereitung”), the one-year transition system between school and vocational training in NRW, is faced with this exact problem of language deficits. Within the framework of vocational education institutions, by *excluding* the group of students not yet being able to enter the regular vocational training school, the VTP represents an *inclusive* system (cf. Frehe & Kremer, 2016). This is paradox, although the *inclusive* aspects, the benefits and values, dominate, when it comes to investigating language in this context as one of the teachers concludes after the test phase: *“Language? Well, language is the instrument of inclusion. Without language sensitivity, I believe that inclusion will fail.”³¹*

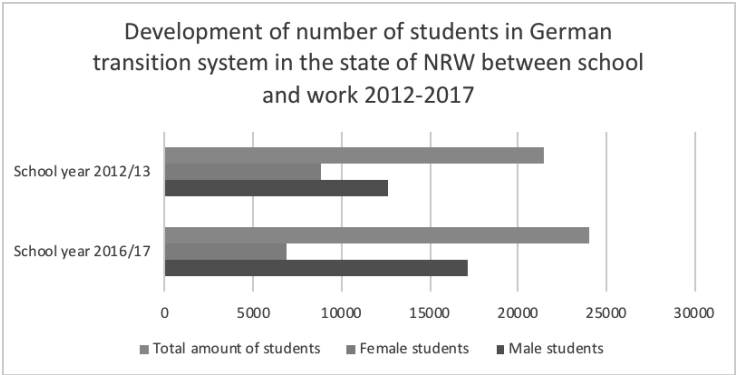
In this course of education, a particularly high heterogeneity

31 VS teacher expert, Interview 02/2018, having experiences in teaching both migrant students and native speaker students.

of students can be detected. The target group's heterogeneity is characterized by young adults with diverse socio-economic, cultural, educational backgrounds – and with a high degree of linguistic competence deficits affecting both native speakers and those with German as a second language. An essential factor is represented by the linguistic skills of the learners, where multilingualism is on the subject teacher's daily schedule. In addition, the deficits of linguistic competence bring about major challenges in teaching matters. These challenges often are burdening as participating professionals reported (more than it is the fact in other parts of the VET system). Hence, the VTP is significantly affected by the need for an innovative concept that supports, relieves, sensitizes (and raise their awareness) and provides teachers with a more structured and faster access to the students.

The following numbers in Figure 1 highlight the increasing amounts of young adults being situated with the above-described problems. It also justifies an increase in the state's expenses with respect to future trainings for professionals in VET institutions. Analyses have shown that, apart from direct linguistic deficits that hamper students to successfully start vocational training (either in a company or full-time in school), the lack of other existing qualifications in subjects often is a consequence of their language issues.

Figure 1.
 Development of number of students in German transition system in the state of NRW between school and work 2012–2017 [own representation based on MSW NRW Quantita (2012, p.100; 2016, p.140)]



The development of the number of students entering or being in the German transition system shows a clear upwards trend. In the past five years, the total amount of students not possessing an adequate qualification to enter the regular vocational system increased by 11%. According to statements of the teachers participating in the project, all students being situated in the VTP system lack linguistic competences leading to problems in technical subject lessons (independent of the professional focus of the specific VS).

Some teachers adapt this challenge with full motivation. Regarding others, uncertainty and frustration might predominate in light of this major task as proven in the first phase of the project. When teaching this target group, vocational-specialist and other technical deficits must be caught up on within this one-year course of education. On the other hand, apart from these vocational or technical deficits (which are often caused by cognitive deficits), there are those deficits related to language problems. Primarily, teachers and students are equally affected by linguistic and communicative misunderstandings and obstacles during the lessons. Solving these situations or problems will require – on the side of the teachers – an awareness for language and the different influence factors leading to the present students' behavior. Under this prerequisite, there are certain possibilities of including language promotion within their own specific subject lessons.

Following the findings of various literature studies in the past few years in Germany (see f. ex. Efing & Kiefer, 2017; Kimmelman, 2017; Baethge, 2014; Efing, 2014; Gehrig, Kimmelman & Voigt, 2014; Sogl, Reichel & Geiger, 2013; Günther et al., 2013; Kimmelman, 2012), it is obvious to recognize how important it is to link subject-related language learning and further promotion in context of vocational training. The advantages of this simultaneous training are characterized by motivational factors as learners understand the need for language competences in realistic vocational action situations. Language promotion strategies are used and trained in the context which means there is no need of transfer. Language requirements or competences are in a direct connection to subject-relevant professional challenges. This means language training becomes far

easier to realize since it happens within the specific context of the subject (see Siemon, Kimmelman & Ziegler, 2016, p.25 et seq.). Learners with different language skills or deficiencies can profit from the interaction with other learners on different levels (linguistic internal differentiation). Whereas learners with deficits benefit from this didactic method, teachers in VTP have to be trained for this new challenge (Kimmelman 2010, p.437 et seq.) which was tested within the empirical investigation of the project.

“Integrated language promotion shall take place! But *how*?³²“ All participating teachers agreed upon the need for creating learning situations that vary linguistically. As interviews demonstrate, these situations should be realized by a mixture of oral and written communication. It has also been verified within the test phase, that “language learning takes place most easily if one has sufficient opportunity to apply the language” (Kimmelman 2013, p.196).

The realization and implementation of this concept takes time. Specialized-subject teachers in VET are educated and trained for questions, answers and explanations with regard to their specific vocational field and the specific didactics. The majority of them is *not* trained for issues of linguistic or communicative competence. Note again that we do not focus on German class teachers here. This is exactly what would be expected from them in VTP classes including their extreme linguistic heterogeneity (apart from subject-related, social, cultural heterogeneity). Instead of ‘expect’, one should probably apply the term ‘absolutely need for a successful inclusive lesson’. Inclusion

32 Statement by teacher expert from a VS, Interview 05/2017.

is here defined in the broader sense of enabling education for all individuals.³³

Recognizing and being aware of this kind of heterogeneity must be openly reflected in adequate teaching and learning concepts. Both integrated language promotion and – in a more general sense – inclusion can only be achieved if teaching and learning methods are designed in a way that allows flexible adaptation and application (cf. Hufeisen, 2017; Roche & Terrasi-Haufe, 2017).

In the project, teachers and scientists attempted to develop and test material of the above-mentioned kind. A more detailed insight into the methodology, the Design-Based Research approach, which was adhered to, will be given in the following chapter.

B. METHODOLOGY: DESIGN-BASED RESEARCH

With respect to the research method, the Design-Based Research (DBR) approach is applied combined with the mixed-methods approach (cf. Euler, 2014; Barab & Squire, 2004; Cobb, Di Sessa, Lehrer, & Schauble, 2003; DBRC, 2003; Dede, 2004). The DBR is used with the aim of analyzing *how, when and why* theoretical innovations work in practice (integration of theory, practice and innovations in the context of VET research).³⁴ The approach thereby uses design experiments to test concepts.

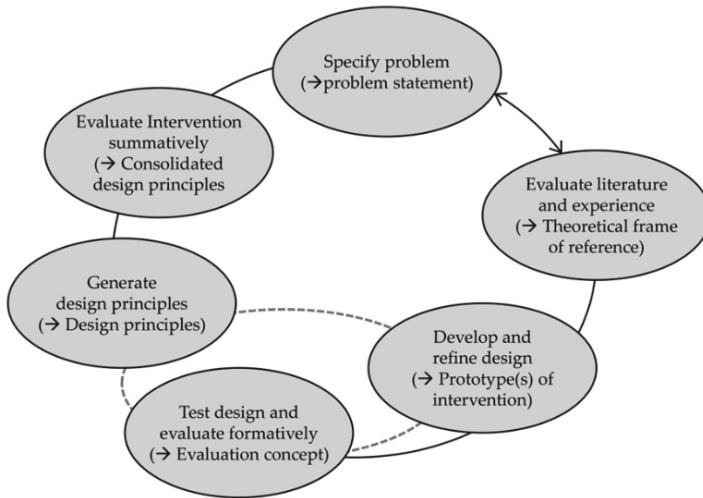
33 For a more detailed view on the definition of inclusion and its interpretations used here, see UNESCO (2009) or in a more critical version, the contribution by Zoyke (2016).

34 A good insight into design-oriented research from a methodological-reflective perspective is f. ex. recently given by Hemkes et al. (2018) and Dimai, Mathies & Welte (2017).

At the current state, there are no studies or good-practice examples dealing with learners' language deficiencies within VTP in the above-described inclusive way. Thus, the project follows a DBR method, justified by combining theory building with a practical development process (Euler, 2014). Barab and Squire (2004, p.2) describe design-based research as a scientific approach that is “not so much an approach as it is a series of approaches, with the intent of producing new theories, artefacts, and practices that account for and potentially impact learning and teaching in naturalistic setting”. Prototypes of developed interventions are continuously re-designed throughout the whole research process while reflecting evaluation results of every intervention's iteration (Euler, 2014).

In line with the process of Design-Based Research, the project is structured as a DBR cycle. The DBR cycle's characteristic elements are illustrated in Figure 2:

Figure 2.
Research and development cycles in the design research process
[Euler 2014, p.20]



After having carried out the pre-study of the project represented by the first two steps of the cycle, i.e. specify the problem as well as evaluate literature and experience (cf. Plomp 2013, p.15; Jahn 2014, p.7 et seq.), the main study includes the development and refinement of the design, testing and evaluating the design before finally the design principles are generated based on the findings.

From the scientist's point of view, it is striven to gain assumptions and statements from experiences of the practice partners (here: teachers in VET institutions) in realistic situations of vocational fields of actions. This includes the analysis of the products of the developmental phase:

1. *Material (written)*: linguistically-sensitive learning material in the specific subject contents of the VS
2. *Communicative teaching interaction (oral)*: results from oral communication in teacher-student interaction when considering language promotion (teacher perspective).

It furthermore attempts to make assumptions for strategies with respect to the results from the test phase of the project by analyzing and evaluating the first prototypes in the form of integrated language promoting working material for the target group based on:

1. the perceptions and experiences by the teachers
2. the perceptions and experiences by students (hardly being measurable in this context, only carried out by taking into account the teachers' perception)

The goal is to formulate design principles derived from the project. The present paper focuses on results from this phase of the project.

Design-oriented research requires a joint process of research and development between scientists and practice players from the analyzed field. It is important that both groups work together throughout all phases of this research design. Four different VS from NRW state, Germany, serve as collaboration partners in the project. In order to gain insights into developing and testing linguistically-sensitive materials and teaching methods of many diverse professional specialization areas, the following VS were chosen as close collaboration partners from the practice (see Table 2).

Table 2.

Projects partners (VS) and their professional sectors and domains
[own representation]

VS_n (with $n = 1, \dots, 4$)	Professional sector and domains	VTP course team size in the project (no. of teachers)
VS_1	technology, health & social issues	3
VS_2	business, technology and social issues	3
VS_3	industry and handicraft	2
VS_4	business & public administration	5

Scientists and VS have the following different functions in the above-described phase of the DBR cycle: Regarding the VS, the focus is on the development and testing of the qualification modules but also dissemination in the vocational schools. In contrast to this, the scientist's focus lies on the project coordination based on their expertise, mentoring and supporting during the test phase through developmental meetings with every VS. Finally, the scientific function also includes test and evaluation reports.

For the context analysis, a set of different methods is used consisting of observations and presentations of participating teachers/schools, teacher questionnaires as a pre-study for subsequent teacher group discussions/interviews with teachers and analyses of student documents (worksheets and questionnaires).

The following results are mainly based on information derived from questionnaires, group interviews, and discussions with the participating schools and teachers. Besides, developed work

materials including language-promoting designs are analyzed and experiences are discussed. This learning material, where the outcome of the different VS differed in its form and content, can be seen as the result of the investigation of the developmental phase. These results show an arrangement of realistic communicative fields of action and tasks as well as innovative forms of texts for the specific professional orientation (f. ex. bicycle technology, professional communication in the service sector, behavior and communication in the field of warehouse logistics) compiled in a *material pool*³⁵.

For a comparison of the expectations and fears with respect to the test phase, and as a preparation or pre-study for developmental meetings/group discussions, VS teams had also answered two questionnaires (one before and one after the test phase).

Collected data has been analyzed using qualitative content analysis (cf. Mayring, 2014; Kuckartz, 2012, Lamnek & Krell, 2010). The design of the developmental meetings and semi-structured guideline interviews follows Helfferich (2011) and Gläser & Laudel (2010).

6. RESULTS OF TESTING AND WORKING WITH LINGUISTICALLY-SENSITIVE LEARNING MATERIAL

In this paper, we are able to demonstrate striking results from the main study (test and implementation phase) yielding assump-

35 For a detailed description and a discussion of the above-mentioned material developed by the four VS as well as a variety of concrete examples from it, see the article by Peitz & Kimmelman (2018b) in Frehe-Halliwell & Kremer (2018).

tions on whether working with integrated language promotion has been – from the teachers’ perspective – a success and by highlighting *how* it has worked according to the design-based research principles. The results are presented after having been thematically categorized according to coding within the context of the qualitative content analysis (see f. ex. Mayring, 2008).

In the following, five approaches are presented according to which linguistically-sensitive material was developed for the classes within their VTP year (see Figure 3):

Figure 3.
Categories of linguistic sensitivity with respect to the developed learning material for subject lessons [own representation]

(1) Linguistic simplification	(2) Linguistic internal differentiation
(3) Use of operators	
(4) Variation in the form of presentation	(5) Deliberate use of questioning techniques

(1) LINGUISTIC SIMPLIFICATION:

Linguistic simplification can be the first methodological approach. This must not be confused with the false belief of simplifying subject contents as far as possible. Considering school regulations, being accompanied by standardized test performances, such a simplification or modification would not be sensible or expedient. After having evaluated the linguistic level

of students, texts should be simplified to the extent that they can understand them. It contains the use of short paragraphs and short sentences, explanations for difficult terms etc. A useful orientation guide is f. ex. offered by the rules of *simple language* (cf. Netzwerk Leichte Sprache, 2013). The extent of simplification must be chosen by the teacher – which is also a challenge, but can be managed with the help of a training. Especially, the long-term benefits will justify the effort.

(2) LINGUISTIC INTERNAL DIFFERENTIATION:

Another category of integrated language promotion is to perform a linguistic internal differentiation. On the one hand, this can refer to diverse linguistic requirements connected to support mechanisms being available to a varying extent. It can also mean language products on different levels within tasks. On the other hand, the aim is to let students of diverse linguistic levels benefit from the interaction with other students, i.e. to design cooperative learning methods for mutual learning processes.

One example of linguistic internal differentiation designed by VS_I includes task sheets which were differentiated according to the students' linguistic levels (see Table 3). Three different versions were created (D₁-D₃) all of them dealing with the same subject content:

Table 3.

Example of linguistic internal differentiation (own representation based on results VS_i)

Linguistic level	Task for students who ...
D1	... shall read and recognize something.
D2	... shall excerpt something from a template/ presentation and shall summarize contents.
D3	... shall be encouraged to write something.

The teachers of VS_i claim that working with the three different versions led to improved first results in terms of a higher motivation of the students in class and a higher success in encouraging them to fulfil the tasks.

(3) USE OF OPERATORS:

Another focus was put on the clear and consistent use of operators (cf. Ohm, Kuhn & Funk 2007). Only if students know or recognize the meaning and significance of an operator, they are able to understand what they shall do within a task (“*Name the following steps ...*”, “*Express your opinion on ...*”). It implies that teachers must clearly reflect whether the task is complex and how complex it is, what is essential to understand it (*receptive skill*) and after that, what will be required to solve the specific task (*productive skill*). This also includes agreements between colleagues of VS when it comes to the use of operators such as cooperatively created and/or used lists of operators for exam exercises as well as training the students in dealing with operators.

(4) VARIATION IN THE FORM OF PRESENTATION:

By varying the form of presentation (in the sense of the type of text and its formal and linguistic preparation), students with diverse language skills can be supported and guided based on their resources and potential. At the same time, integrating different sorts of texts and its visual/graphical/didactical preparation or presentation promotes diverse factors of linguistic skills which means it serves a holistic approach of language promotion within specialized-subject classes.

(5) DELIBERATE USE OF QUESTIONING TECHNIQUES:

Questions being asked to students (orally or in writing) are preferred to be constructed in a short, clear and intentional way. The short length of a questions has an influence on the understanding (depending on the level of linguistic deficits, a long question can heavily inhibit the process of understanding) and it can positively influence the memorization process regarding the content of the question. Posing clear and intentional questions means the teacher should take into account referring only to the concrete topic of the lesson. With respect to spontaneous questions, it is recommended to do so as authentic and lifelike as possible.

In the project, teachers from the four VS developed and modified their teaching methods and learning material considering the above-described categories, whose first results of the test phase are analyzed and discussed in the subsequent chapter.

7. ANALYSIS OF FINDINGS: IMPLICATIONS AND EFFECTS OF DEVELOPING CONTENT-RELATED LANGUAGE PROMOTION – WHAT TEACHERS TELL US

In this chapter, the results from the test and implementation phase are demonstrated. What do teachers tell us from the experiences they had with the language-promoting learning material in class? After presenting a comparison between expectations before and experiences after testing the learning material, assumptions are made about the relation of the efforts and benefits of this topic (‘expenditure and revenue’). Potential discrepant perspectives of teachers and students are discussed. Finally, the role of the teacher and the necessity of support beyond linguistically-sensitive learning material is highlighted.

Dealing with the ‘new’ learning material – “a lot of work but now we are making progress”

As the statement above emphasizes, the developmental meetings with teachers participating in the project revealed throughout a positive feedback. It remains to be seen how the re-design of the material will have an impact on the success of the lessons and how students will react on the integrated language promotion after more time will have passed. Note that this is only the first phase of applying these new didactical methods of teaching.

For now, the VET personnel admit that working with the material and its contents has been a tremendous effort, but the teachers of all participating VS recognize that they all are “being sensitive to language concerning our subject” which leads to

the conclusion that “there is an effect!” (teacher VS₁, Interview 01/2018). According to the teachers of VS₁, only by integrating language promotion and designing the contents in a linguistically sensitive way, their students are “able to autonomously perform the tasks” (Ibid.).

With respect to taking language into account during oral communication, teachers now pay far more attention to be “linguistic role models” (teacher VS₁, interview 01/2018). They ask themselves questions such as “Does she/he know the term”, “Did the student understand me?” or “Do they know the origin of the words?”. Then they integrated small vocabulary exercises into the lesson to train terms as *Fungizid* (*fungicide*) with the help of *Pizza Funghi*, or the noun *copyright* being usually used in German language use is explained by its English origin.

Often, in particular with regard to written exercises where students show the most severe problems, formulations are provided by the teacher in order to encourage the students to write or even start writing. This has brought some positive results following the statements of teachers from all VS.

Supporting subject-related content with changes in the form of presentation is especially highlighted in testing the material and strategies so far: “There are individuals with visual disposition and there are individuals which have a linguistic disposition. These are two very different types of people. Thanks to the integrated language promotion aspects, we can handle both types well when teaching specialized-subject content” (teacher VS₁, Interview 01/2018).

“IT ’S ALL ABOUT THE N+1”

The citation above made by one of the teachers within the project (VS₂, Interview 02/2018) brings up another essential aspect: this is a challenge within the challenge. A lot of students possess the cognitive skills, but are just unable to understand things due to language problems. The special requirement for the teacher is now to support the student linguistically, but not to demand too little from him with respect to the content but to offer them a level that is n+1. This means teachers demand a little more than the students' performance level contains stated by the same teacher as follows: “We have to meet the students’ needs. That means we have to offer a setting that is potentially understandable. However, the recipient also must have the chance to, as I’ll call it, have to be challenged by the things we offer them.” (teacher VS₂, Interview 02/2018). As stressed by Leisen (2017) in his manual about content-related language promotion, the level of what is taught should always be a little higher than is currently given. “Otherwise, you will risk a situation of undercomplexity”, the teacher warns (VS₂, Interview 02/2018).

It has to be reflected critically, though, that up to now, the manual focuses on science subjects such as biology and is furthermore not perfectly suitable for the present target group (here: students in Vocational Training Preparation). Some of the teachers in the project reported that suggestions by Leisen (2017) serve as appropriate stimuli for methods of training vocabulary or how to design a certain task sheet.

Discrepancies between teachers' and students'
perspective

- 1) How did the teachers experience developing and working with the “new” material?

Dealing with the topic, i.e. time and effort that was put into the development of ‘real’ products in the form of working material, yielded a completely new understanding of language and its importance in the context of teaching specialized subjects within VTP.

On the one hand, teachers perceived positive effects as students were now able to understand what they were asked to do in the tasks, either in general or faster. As was agreed upon, the effort will pay off. They reflected their own learning material with regard to its quality and were then sensitized for the way the contents were prepared within text books. By varying the form of presentation, such as by using icons in order to point to a certain kind of instruction, providing the students with texts in simple language etc., the students are successful in getting access to vocationally relevant contents. Language and communication skills are learned where they are essential: directly linked to vocational registers.

On the other hand, there was a change in the teachers’ attitude. They recognized that they had to take more into account and react on the things the students say. The test phase has shown improvements on the students’ language use and learning success as a consequence of the fact that the teacher carefully watches out for formulations in students’ oral communication.

It should be pointed out to the students whenever there is a misunderstanding that this will be eliminated. Teachers are recommended to ask more frequently when they could not understand what students said. Within this target group of young adults, it was observed that they often participate only if they are encouraged to do so. They also seem to show tendencies of incorrect use of language or mumble when they talk. Interventions by the teachers, f. ex. in the form of linguistically-sensitive methods or also just a conscious asking of “Could you repeat it clearly, I didn’t understand you”, already lead to improvements with respect to oral communication participation. The following example demonstrates this aspect (teacher VS₃, Interview 02/2018):

The students very soon reach a state in which they have the feeling, ‘**this is sufficient**’. That was the wording. This is sufficient. And it is not. And there you have the difficulty. Also for us, as teachers. And I also observed it in myself. In the beginning, I took it very very accurately, because I didn’t understand the students at all. I had to concentrate very hard, by now I go along with their mumbling. By now, I am able to understand them with their half syllables. [...] Well, yes, I adapted to it. And I must not do that. As a teacher, I then have to signalize ‘I did not understand. Could you please repeat it clearly? I know you can do it.’ I am now in the phase where I have realized that.

A third aspect deals with inclusion (in a wider sense). In the project test phase, integrated language promotion has proven to have a positive effect on both students with cognitive deficits and those with language problems. Both types are reached

by the use of a simpler language, support in formulating texts, a change in the form of presentation etc. The example below highlights this assumption:

What we have is an image sequence, we have assistance for formulations, in fact we have some kind of glossary, a list of vocabulary, and we also have a reading aid. That way, that is support in both a linguistic and cognitive manner. If this is reasonably presented, is integrated, I believe, we have a relatively good chance, f. ex. if this would be taught in biology this way, to promote somebody having cognitive difficulties and as well somebody with difficulties in the linguistic field, or both. Well, to me, language sensitivity is indeed a key for success in inclusion. (teacher VS_r, Interview 02/2018).

- 2) How did the students experience the new forms of integrated language training in subject lessons?

Students' experiences can be analyzed only on the basis of observations and estimations carried out by the teacher (existing project data). For the students, making progress with respect to subject-related contents is still very difficult. In particular, terminology still is a challenging subject. Getting the access has been simplified through the integration of language-promoting methods described above, according to the experts from the practice having been interviewed. In many cases, the access was enabled through language sensitivity in the first place.

Following the evaluation of the teachers within this study, the following aspects worked particularly well:

- Tasks designed with different linguistic levels (Linguistic internal differentiation)
- Formulating tasks in such a way that both technical terminology and a language comprehensible for the student are included (Linguistic simplification)
- Visualization (Variation in the form of presentation)
- Breaking the content down into small incremental pieces (Linguistic simplification)

Due to the predominant language deficits and thus, the difficulties in expressing something in writing, collecting data from students' perspective still is rather scarce. In an attempt to get an insight of how students within VTP evaluate how they got along with the developed learning material characterized by integrated language promoting aspects, until now, only a few students wrote down their experiences. The analysis of these sheets is still to be done.

The role of the teacher and the necessity of support
beyond linguistically-sensitive learning material

Assumption: With respect to teaching the target group in VTP, it is decisive to consider and investigate both the personal level and the technical/professional level, since they always correlate with and influence each other. It has become evident in the course of the project that – one the teacher side – it is necessary to evaluate and/or develop their own language awareness. The success of an inclusive teaching and interaction with each other largely depends on this.

For the teaching personnel, it was shown that this is a challenge. But it was exciting to observe how the perception of the

practice partner changed throughout the test phase. There also was the realization that if teachers neglect dealing with language, this would involve consequences as one teacher states in an interview in 05/2017:

Well, since the beginning of this project I am more aware, I acted more unconsciously before. I realized that many students in fact nod their head, but they do not understand anything at all, and this doesn't help me, I therefore have to dig deeper, have you really understood this? I realized this thanks to a number of mistakes, that students have done. Yes, I realized that it was my mistake. [...] Yes, that I did not explain it sufficiently, [...] yes I just have to speak in a simpler way, to explain it more clearly, to train the students with the terminology, yes.

This perspective came up in developmental meetings as well, when teachers saw themselves as “linguistic role models” for their students during their test phase with the linguistically-sensitive design of specialized subject classes (teacher statement VS_p, 01/2018).

In contrast to this, on the scientist's side, results opened up entirely new perspectives: developing learning material helps improving successful teaching and encouraging students to learn and prepare them for a subsequent vocational training and the job market. But there is far more complexity regarding this construct, since, for teachers, factors such as being able to empathize, reflect their own use of language, reconsidering written and oral communicative patterns etc. have a great impact, too. Training measures and activities will then have to have a different design.

“In our field, language is the warp and the woof. For me, though, it is not about accuracy. It is about esteem. [...] The teacher’s esteem for the student.” (teacher VS₂, Interview 02/2018). Most of all, language can be seen as a control element in the context of this target group. At the time teachers in VTP start dealing with this topic, become familiar with it and, as an example, ask themselves how they would react if they had to explain a certain fact, they *think the student’s thoughts* and will be better able to respond or react during the lesson.

For the students, two birds are killed with one stone. Through being provided with linguistically-designed learning material, they will get a faster access to vocational/professional contents. On the other hand, by applying specific techniques such as was described above they learn to strengthen their own communication competence – in fact at the location where they need it: their future vocational environment.

8. DISCUSSION AND SUGGESTIONS FOR FURTHER RESEARCH – LANGUAGE AS THE WARP AND WOOF OF VOCATIONAL EDUCATION

After having completed the testing phase, the project has produced viable, feasible and adaptable QM, although they have to be further developed in the future. These modules shall be utilized by the vocational schools regarding their fundamental work of the course of study as e.g. the annual didactic planning. This involves distributing the topic of subject-related language promotion to the whole team of teachers responsible for the VTP classes. It is also recommended to determine a firm team

having been trained and sensitized for methods and strategies presented in this paper.

The material that was developed within the project seems to be an adequate start for working with integrated language promotion. Subject contents were well received and accepted by the students who have proven to get along better with the tasks according to the teachers' statements. Moreover, having dealt with language and what stands behind this vague but huge term, prepared the participating teachers which aspects they need to pay attention to regarding their specific subjects. This included f. ex. to think and reflect about the linguistic/communicative obstacles that can arise and can cause misunderstandings.

Professional subjects and in particular the terminology behind them remain a great difficulty to learn for the students in VTP, but the 'new' awareness of teachers combined with the new knowhow on practical support in the form of language-promoting methods that can be included in a flexible manner improves the situation a lot – students finally achieve subject-related learning progress with linguistically-sensitive material and simultaneously their language skills can get better. This is the (only) chance to motivate them to pass VTP in order to enter a (dual) vocational training and for securing their future on the job market.

<p>A successfully integrated language promotion in VTP is a complex interplay of three factors</p>
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There are limitations on what teachers can handle. And it was proven in the project flow (up to the first test phase) that it is not always a matter of adequate teaching material (in the form of

worksheets). Instead, it seems to be an interplay of the role how the teacher perceives herself/himself and their attitude towards language and how they perceive the individuals and their know-how and use of language. This influences the teacher's reaction and action in the lesson (moderator, trainer, consultant and motivator). Another part of the interplay is represented by the material the teacher integrates orally and in writing into the didactic planning and implementation of the lesson: it is recommended that this will completely be modified or chosen in line with its potential of being linguistically-sensitive.

Results of this investigation showed that, in particular, professional or technical terminology should be learned and trained via applying methods (cf. f. ex. Leisen 2010, 2017). Literacy and comprehension shall be improved through the use of texts in simple language, where a few rules and texts (either for a fee or free of charge) on diverse topics such as business, economics, politics, engineering etc. are on offer. Nevertheless, these offers need to be extended in numbers and the diversity of topics. Linguistic internal differentiation is, according to what has been tested with the learning material in the project context, inevitable, especially due to the highly differing language skills. One example presented here would include providing the students with tasks and information in two to three diverse linguistic levels of difficulty.

In conclusion, for specialized-subject teachers, three factors play a significant role for the success of an integrated language promotion in subject lessons with learners in VTP:

- Dealing with *language sensitivity and modification of the learning material relevant* in the specific subject

- The *perception, recognition and acceptance of different linguistic skills*, backgrounds, influence factors (diversity and heterogeneity) of the students, factors being important for the chance for equal participation
- The *teacher's own awareness for language* and their attitude towards students with respect to this topic.

A closer examination and afterwards comparison of questionnaires is yet to be done. One questionnaire was developed before the test phase had begun in order to record the participating teachers' expectations of working with the new strategies and learning material. The second questionnaire was created to collect data regarding their experiences. Although it is statistically not representative due to the low sample size, it will yield some important indications f. ex. with respect to the way the overall topic of language sensitivity should be incorporated in the VTP framework in VS institutions and how to prepare and train the affected teachers. The questionnaires are also a good pre-study for further discussions between teachers from the practice and researcher from science.

Implications for action regarding integrating language promotion within the context of vocational training preparation:

For future research, the topic of teacher professionalization shall be extended into the direction of a more international way (cross-national comparison, "learn from the neighbors"). This might involve experiences from other countries' VET sector – countries that also had to deal with migrant flows entering the

transition system between school and work where professional personnel within vocational education systems were confronted with teaching both language and subject lessons since they were forced to do so as a consequence of these sudden student flows.

The idea would be to design a concept considering both target groups addressed in this article (teachers in Institutes for vocational education and training and young adults being in the VTP in Germany) and by furthermore linking technological innovations and self-regulatory methods. It all repeatedly comes back to the central person in the whole study of investigation: dealing with the clientele described above, **the teacher plays the central role** since she/he simultaneously is moderator, trainer, consultant and motivator as discussions with diverse teachers prove.

What does educational training maturity (“Ausbildungsreife”), the aim for students attending the VTP, mean then? Does the theoretical framework of this term not have to be overthought when taking into account what has been presented in this article? Whereas it is essential to know the language that is relevant for one’s specific profession (oral and written specific for the profession) and how to apply it, there are jobs in which written language skills are less important than in others. This leads to the requirement of a concept – such as was exemplarily documented above – combining professional skills with language skills with the objective of preparing the students for taking up vocational training in a specific field. Language promotion methods which are constantly added to the regular subject lesson (politics, economics, automotive engineering, social healthcare, mathematics etc.) will bring a new kind of educational training maturity with more effect than before with respect to this target group within the transition system.

It remains to be seen how much effort and time teachers are willing to invest, and furthermore, how vocational schooling institutions will react on that. A consistent and continuous integrated content and language learning may be incorporated in all VS. This includes actions such as integrating this concept into their school law and curricula and invest in the form of giving **the teachers further training in language sensitivity within subject lessons**. With respect to the special course of education, the VTP, a team might be built that is permanently installed and responsible for teaching the target group.

9. CONCLUSION

In this paper, the relevance and necessity of an innovative approach with regard to teaching subject lessons within vocational training preparation was argued for.

The VTP system and its students as target group of this investigation were examined. Without doubt, language plays an important role in the field of VET, as does integrated language promotion in vocational training preparation. There is as well no doubt about its diverse characteristics in terms of the influence on (young) individuals. On the micro-level, the two main goals that we refer to in this paper are the understanding and improved learning in subject lessons in the vocational schools on the learners' side, and to train the teachers in dealing with the target group. On the macro-level, the aim is to improve the chances for the learners concerning their future professional and personal success in life and on the job market.

As the teachers addressed here are subject experts and often no language trainers or they lack the awareness for language,

approaches were developed and tested in the project context. These approaches aim for a concept on preparing and training teachers in this field of VET and regarding the target group in the transition phase between school and job. A promising approach seems to be the combination of providing teachers with strategies in order to develop or work on integrated language promotion in subject lesson material with, on the other hand, training them to develop an awareness for language. The latter one here is the precondition for the former one.

As didactic methodological approach, diverse elements for linguistic assistance and promotion are connected with each other and possible implementations for a connection and integration into subject lessons were presented. By using these as a theoretical background, they were adapted by teachers from different vocational colleges in NRW, Germany. Analysis findings showed that there is a lot of practicable potential. Learners seem to get a faster and better access to subject contents, teachers perceive an improvement in students' task results or oral communication situations. The application of linguistically-sensitive material and other strategies shall be further developed, the findings in this paper represent a first phase of testing, analysis and evaluation. In any case, they highlight the need for awareness of languages and chances an integrated language promotion in subject lessons requires for teachers in VET.

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What Role Should Universities Play in Career Guidance for Preparing Students for Successful Studies and for Work? Case Study of the IDEFI "Emotional Capital" and Guidance Program for freshmen Students in Sciences of Education of the University Montpellier 3 in France.

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Abstract: Since decades, universities have faced drop outs or low rate of success among freshmen students. Thus they have been required to prepare students to be committed with their studies and to career guidance to their students. Some of those responsibilities have inevitably landed at the door of academic staff. At the university of Montpellier 3, the special program IDEFI, based on innovative training programs, has been set up to answer this concerns. In this communication, we will present this program addressed to future teachers and educators enrolled in sciences of education based on active collaborative pedagogy in career guidance unit of education. We will underline the personal and social emotional competencies as transversal and transferable competences that this program develops helping at developing students resilience during the stressful first academic year as well as developing their self-awareness and

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confidence impacting studies performance. Despite, academic staff wasn't be expected to be careers guidance professionals, the program IDEFI "Emotional Capital" has been designed in an way according collaborative active learning approach that it helps young people to explore the opportunities open to them and make purposeful steps towards their future by developing their emotional capital. In this IDEFI program, this challenge has been seen as an integral part of teaching, something that is exciting and helps unlock students' potential by developing their transversal and transferable competencies.

Keywords: Emotional capital

*Watch your thoughts;
They become words.
Watch your words;
They become actions.
Watch your actions;
They become habits.
Watch your habits;
They become character.
Watch your character;
It becomes your destiny.*

Lao Tzu

1. INTRODUCTION

Since decades, universities have faced drop outs or low rate of success among freshmen students. Thus they have been required in France in their new missions, to prepare students to be committed with their studies and to career guidance to their stu-

dents. Some of those responsibilities have inevitably landed at the door of academic staff. Should Academic staff be expected to be careers guidance professionals (Hooley and Dodd, 2015)? According those researcher, career guidance professionals bring expertise in theory and knowledge of the labour market and links with employers to the table, while professor bring pedagogic knowledge and have sustained relationships with their students. Nevertheless, those different stakeholders help freshmen students to explore the opportunities open to them and make purposeful steps towards their future. At the university of Montpellier 3, the special program IDEFI “UM3D-Emotional Capital, Health and Performance” (IEDFI), based on innovative training programs, collaborative active and positive learning, presented in this paper has been set up to answer this concerns and we will see that it helps student at feeling engaged in their studies and to success while knowing themselves and developing their transferable and transversal skills.

2. THEORY AND METHODS

2.1 THEORY

The OECD's definition of career guidance refers to individual and group activities, online and onsite activities and education, counselling, world of work experiences and system development. Precisely, career guidance refers to services and activities intended to assist individuals, of any age and at any point throughout their lives, to make educational, training and occupational choices and to manage their careers ... The activities may take place on an individual or group basis, and may be face-to-face or at a distance (including help lines and web-based ser-

vices). This definition encompasses a range of activities which are commonly found including the provision of career education, information, advice and guidance.

Despite, academic staff wasn't be expected to be careers guidance professionals, the "IDEFI-UM₃D-emotional capital & well-being & performance" (named shortly IDEFI) program addressed to future teachers and educators enrolled in sciences of education looks at engaging students in their studies through career guidance unit of education (PPP –professional personal project) based on collaborative active pedagogy, teams work and positive education.

Indeed, it has been designed in an active way that it helps young people to explore themselves "knowing yourself" as advice offered by philosophers throughout the ages to their students and to explore the opportunities open to them and make purposeful steps towards their future by developing their emotional capital.

In the IDEFI program, this challenge has been seen as an integral part of teaching, something that is exciting and helps unlock students' potential and helping students resilience by developing their emotional capital which is related to transversal and transferable competencies. Thus it refers to different concepts and theories that we summarize as following: Knowing yourself by Self and through Others, Emotional capital and the equation of the "Successful Learning Process" or "Successful Learning Equation" related with the theory of mind and Brain and Learning process and Values Definition.

Knowing yourself by Self and through Others

Thales, Socrates, Lao Tseu or from “Know thyself”’s inscription from the oracle at Delphi inscribed in the vestibule of the Temple of Apollo, philosophers throughout the ages offered this same advice to their students. These words are as valuable today as they were almost three thousand years earlier. Part of “knowing yourself” is understanding our beliefs. Knowing and understanding self personality traits may assist students in making career choices. By promoting students self-knowledge via a self introspection and through the Others’ view by work teams, it helps at figuring out students future path and to do so, collaborative active learning approach has been used in IDEFI. To identify and build on students strengths and work more constructively with others. Getting to know themselves and understanding their motivations can help students make informed choices about their studies and their future career.

Collaborative Active Learning

The IDEFI pedagogy refers to “collaborative active learning” described as a classroom approach which acknowledges that learners are active in the learning process by building knowledge and understanding in response to learning opportunities provided by their teacher. First, if the concept of collaborative learning, the grouping and pairing of students for the purpose of achieving an academic goal, has been widely researched and advocated throughout the professional literature nevertheless not that much implemented in our university. The term “collaborative learning” refers to an instruction method in which students at various per-

formance levels work together in small groups toward a common goal. The students are responsible for one another's learning as well as their own. Thus, the success of one student helps other students to be successful. Proponents of collaborative learning according Gokhale (1995) claim that the active exchange of ideas within small groups not only increases interest among the participants but also promotes critical thinking. This contrasts with a model of instruction whereby knowledge is imparted or transmitted from the teacher to students. Active learning means that learners take increasing responsibility for their learning, and that teachers are enablers and activators of learning, rather than lecturers or deliverers of ideas. Active learning is also consistent with theories of learning underlining that learning should be relevant and situated within a meaningful context as developed by the French philosopher Rousseau, which influenced numerous educators in the early 20th century such as Dewey and Montessori. Active learning can essentially be defined as "students doing things and thinking about what they are doing" (Bonwell and Eison, 1991). It is an approach to education that involves and engages students in the teaching and learning exchange. As opposed to a transmission approach of education, which positions the instructor as the "keeper" of knowledge to "deposit" the learning in the receptacles that are the students' brains, active learning recognises the role that students hold in their own education.

Emotional Capital: from emotions to emotional competencies toward a Successful Learning Process

Emotional Capital (EK) defined by Gendron (2004) as "the set of resources(emotional competencies) that inhere to the person,

useful for personal, professional and organizational development, and participates to social cohesion, with personal, economic and social returns” is an essential capital for all and precisely in education. EK is a crucial capital as it impacts people’s learning processes, especially for children and young people at risk, enables their balanced human development, which participates in social cohesion, smoother human relationships, their future successful life in the society and already to their school retention and success. Regarding its effect or returns, neurosciences (see Damasio, Oecd report on brain and learning process), brought the evidence that emotional competencies impact the learning process. According to the capacity of regulation of emotions, referring to emotional competence, an appropriate EC can facilitate the learning process. Emotions and brain interplays in the learning process. Teachers or educators rarely have modeled the learning process. When they present material to the class, it is usually in a polished form that omits the normal steps of making mistakes (feeling confused), recovering from them (overcoming frustration), deconstructing what went wrong (not becoming dispirited), and starting over again (with hope and enthusiasm).

Also, a typical learning experience involves a range of emotions, moving the learner around the space as they learn for Kort, Reilly and Picard (2001) from Media Laboratory, M.I.T. They proposed an “Affective Model of Interplay between Emotions and Learning” which stressed out the emotions interfering in the learning process. They designed a frame (figures 1) which combines those different aspects; precisely, they designed a multidimensional combinations model of emotions where in the horizontal axis, the positive valence (more pleasurable) emotions are on the right; the negative valence (more unpleasant) emotions are on the left.

Fig 1.

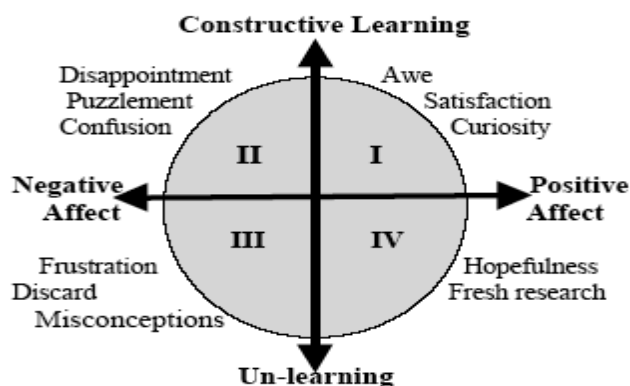


Figure 2a – Proposed model relating phases of learning to emotions in Figure 1

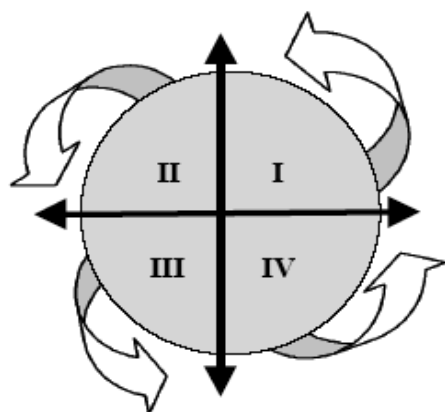


Figure 2b – Circular and helical flow of emotion

Source: Kort et al. (2001)

The vertical axis is called the “Learning” Axis, and symbolizes the construction of knowledge upward, and the discarding of misconceptions downward. Typically, movement would be in a counter-clockwise direction. The learner ideally begins in quadrant I or II: he or she might be curious and fascinated about a new topic of interest (quadrant I) or he or she might be puzzled and motivated to reduce confusion (quadrant II). In either case, the learner is in the top half of the space, if his or her focus is on constructing or testing knowledge. At this point it is not uncommon for the student to move down into the lower half of the diagram (quadrant III) where emotions may be negative and the cognitive focus changes to eliminating some misconception. As the learner consolidates her or his knowledge—what works and what does not—with awareness of a sense of making progress, he or she may move to quadrant IV. Getting a fresh idea propels the learner back into the upper half of the space, most likely quadrant I. The Kort et al. model’s is a model attempting to interweave different emotions axes with the cognitive dynamics of the learning process underlining the impact of the regulation of emotions and inspire us combine with the theory of Mind, to define an equation of successful learning process (Gendron, 2010).

Psychology has traditionally identified and studied three components of mind: cognition, affect, and conation (Huitt, 1996; Tallon, 1997). Cognition refers to the process of encoding, storing, processing, and retrieving information: the process of coming to know and understand. It questions “how we learn” and generally associated with the question of “what” (e.g., what happened, what is going on now, what is the meaning of that information). Affect refers to the emotional interpretation

of perceptions, information, or knowledge. It is generally associated with one's attachment (positive or negative) to people, objects, ideas, etc. and asks the question "How do I feel about this knowledge or information?" It questions "how we feel regarding the topic"; it's about the emotional interpretation of perceptions, information, or knowledge. Conation refers to the connection of knowledge and affect to behavior and is associated with the issue of "why": "why I should learn it". Precisely, it is closely associated with the concept of volition, defined as the use of will, or the freedom to make choices about what to do. It is the personal, intentional, planful, deliberate, goal-oriented, or striving component of motivation, the proactive (as opposed to reactive or habitual) aspect of behavior. It is absolutely critical if an individual is successfully engage in self-direction and self-regulation as it refers to the intentional and personal motivation of behavior (e.g., the proactive direction, energizing, and persistence of behavior). Indeed, many researchers believe volition or will or freedom of choice is an essential element of voluntary human behavior and that human behavior cannot be explained fully without it concurs, suggesting that conation is especially important when addressing issues of human learning (Donagan, 1987; Hershberger, 1988). And more recent literature has focused on the concept of self-regulation as an aspect of conation (Bandura, 1991, Schunk & Zimmerman, 1994), adding an additional dimension to the study of self (self-concept, self-esteem, self-reflection, self-determination). One reason researchers in the areas of cognition and attitudes have not demonstrated a strong ability to predict behavior is because the construct of conation has been omitted. Indeed, at the beginning of modern psychology, both emotion and conation were

considered central (Wallon, 1938) ; however, interest in these topics declined as overt behavior and cognition received more attention (because of Piaget ideas' domination) (Amsel, 1992). One reason that the study of conation has lagged behind the study of cognition, emotion, and behavior is that it is intertwined with the study of these other domains and often difficult to separate (as opposed to reactive or habitual) (Snow, 1989).

Conation is necessary to explain how knowledge and emotion are translated into behavior in human beings. Some of the conative issues one faces daily are: what are my intentions and goals; what am I going to do; *what are my plans and commitments?* Goals must be difficult, but attainable (Franken, 1997). Following the Yerkes-Dodson law (Yerkes & Dodson, 1908), moderate amounts of difficulty lead to optimal performance. Setting goals that are perceived as too easy or too difficult might impact students behaviour in their studies involvement and commitment. Thus, referring to the three components of the mind, Cognition, Affect, and Conation, the learning process equation or the successful learning function should be redefined not only focused on cognition. Gendron (2010) according the 3 variables, defined an equation of "Successful Learning Process" as follows:

$$\text{"Successful Learning Process"} = f \\ (\text{Conation, Affect, Cognition})$$

Source : Gendron (2010) *Successful Learning Equation*

In this equation, "conation" refers for Gendron, to *"what are my plans and commitments? To which extent I feel engage in my studies?"* and thus Gendron underlined that students involve-

ment and commitment in their studies, is positively correlated with students' studies performances but above all dependant and supported by students' "values" regarding their professional choices.

Values, Engagement and Quality of life: defining students values in their carreer guidance determines students performance and future jobs satisfaction and well-being at work

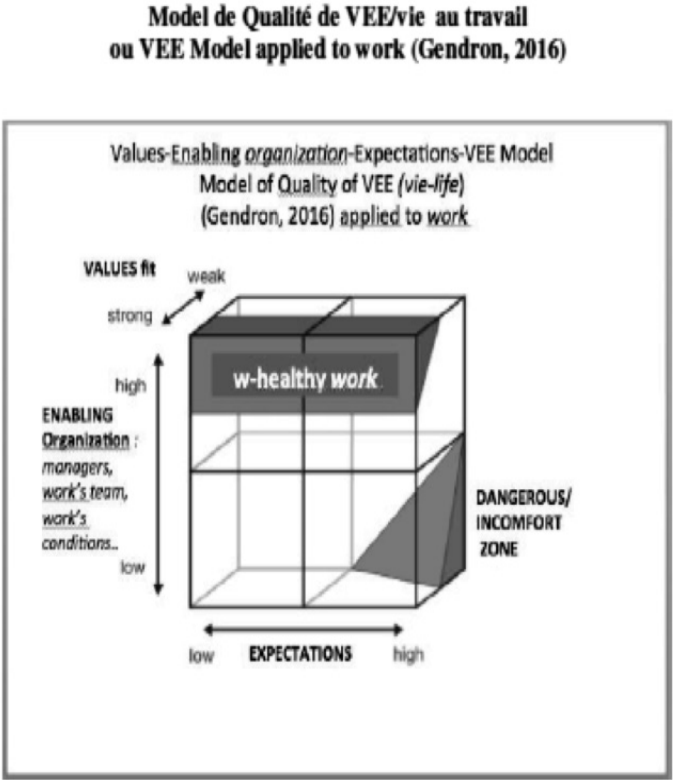
Values play an important part in occupational selection and job satisfaction. They are widely viewed as central to the selection of, and subsequent satisfaction with, life roles. As they have a huge importance in deciding the work satisfaction our life, we must care about them already to prevent studies' drop out or further, psycho-social risk at work in case of misguidance. Values are related to students' personality (eg a desire to work with or manage others), needs (eg hunger, shelter, security) and their own understanding of their social context (eg environmentalism or political values). We refer not only to "personal values", but also "values at work" which might be confronted to the students values, desires and abilities assessment (measured by skills). Precisely, a considered career choice involves a series of estimates, including: students own skills and values, the skills required to be successful in the career, the work values it is likely to satisfy for students i.e how we relate our values to work may be affected by such factors as socio-economic status, gender, ethnicity, and cultural context. But for many people, the greater the congruence between the series of estimates, the more likely we are to find our career choice satisfying. Thus, the ability to evaluate

accurately students' individual strengths and weaknesses, and personal preferences and traits, is critical. Ideally, then, to make a good career choice, it is needed to be clear about and incorporate students values along with other factors – skills, qualifications, interests and personality. Indeed, personal values are ideals. But the real world is full of compromise and contingency, and it is necessary constantly to prioritise values accordingly. It may happened to change them through reflection, experience, or pressure to align selves with dominant values in the social context or the workplace. Values are used to assign positive and negative properties to different careers, companies, corporate cultures and lifestyles, and make decisions on that basis. Some of the values of the people may be shared around you (friends or family, or social, ethnic or national group, for example) and other values may be particular to each person.

Values at work relates to how we would like to see some of our values expressed in their career. Ideally, our values will be in line with each other and with the corporate values of the organisation you work for. In relation to careers and the workplace, students values may include things which make them feel good (or bad) about their work, and things that encourage them to stay in a job (or leave) – for example, not only tangible and intangible rewards but work conditions as well, such as working in a team or working alone, having an own office or sharing an office, autonomy or supervision and direction, competition or collaboration, helping people or making a profit, working for a large, well-known organisation or a small, up-and-coming company ... Thus, the greater the congruence between the series of estimates, the more likely students are to find their career choice satisfying and studies as well and will feel committed with their

work studies, which impact their academic performance. Guidance and career values and a sense of life purpose can be a major factor in the level of commitment and personal involvement in their studies. Literature enlarged to “work values” encompassing a variety of notions, ranging from work ethics, and personal needs to work preferences, has demonstrated the importance of work values as an influence on attitudes toward work, involvement and commitment but also on well-being underlying life satisfaction. Also, values are socially approved verbal representations of basic motivations (Schwartz, 1992). Schwartz’s (1992) theory of universals and structure of basic values, defined as desirable goals, varying in importance, that serve as guiding principles in people’s lives. Schwartz proposed ten distinct types of values (self-direction, stimulation, achievement, benevolence, hedonism, universalism, power, security, conformity, and tradition) deemed to be comprehensive antecedents of motivations common to people across cultures. Schwartz’s values model provides insights into underlying processes of positive/negative influence of values on well-being in terms of life satisfaction. The model distinguishes ten basic values grouped in four dimensions: self-direction, stimulation (Openness to Change), achievement, power, hedonism (Self-Enhancement), security, conformity (Conservation) and benevolence, universalism, tradition (Self-Transcendence). It allows to hypothesize direct relations of types of values to well-being based on “healthy” (self-direction, stimulation, achievement, benevolence, universalism) and “unhealthy” (power, security, conformity, tradition) values and to determine zone of quality of life at work as defined by Gendron (2016) in a VEE Model (Values, Expectations, Enabling Organisation/ Environment).

Fig 2.



Source: Gendron (2016), Model VEE – Values, Enabling Environment and Expectations- of Quality of Life

This models applied to students' work illustrates the zone of comfort where students are engaged and involved in their studies when their personal values match their professional studies and find an enabling environment to work and accomplish

themselves (as found in active pedagogy). Precisely, Gendron's VEE model (2016) determines a "w-healthy" zone of work combining a good match between "values" "enabling environment" and "professional studies expectations".

A. RESEARCH AND IDEFI INTERVENTIONS OBJECTIVES AND METHODS

The main objectives of the IDEFI program is to help freshmen students, future educators or future teachers, enrolled in the first year of sciences of education in South of France at the University Montpellier 3, at performing in their studies by working on their career guidance. As the old philosophers advice "knowing yourself", the IDEFI program has been set up with a special approach to make student learning about themselves by themselves but also by and through the Others. Already in this guidance unit of education concretely, students had in teams to discover a range of jobs in their field of sciences of education and to learn from this variety of jobs and then to create a serious game involving those jobs informations to make those latters discovered by the other groups' of students during one half-day festival performance organized in teams' workshops.

To do so, based on a plural theoretical framework of active and positive and successful learning as described above we organize the training in two phases according the two tools used. Indeed, the IDEFI interventions is articulated around the two phases of training. First, we started with the part "knowing yourself through Others" with 3 workshops of 4 hours using the action learning pedagogy according Dewey work by using "PIA2 – Project Management as an Instrument with Respect to Labor

Marketfor Development and Assurance of Teaching Quality in Vocational Education” set up by Gessler & Uhlig-Schoenian (2013). The main objective for students, by working by groups on a common project, is to learn about themselves and each other, to evaluate properly and to work together collaboratively. Using a variety of exercises we facilitated students’ commitment into their projects of discovering jobs in their career field. This way, students become actors of their projects where team spirit had an important place. In order to constitute the groups, a short questionnaire allows students to identify their profile choosing from four categories: manager, visionary, analyst, and collaborator. More, in this approach, each member has responsibilities which alternate and specific duties which contribute to the team performance. Each team uses “a board notebook” in order to manage project’s progress and, this way, each students learn to control him/her self and to develop his/her deductive, inductive, analytic, synthetic and critical spirit. Using a guidebook, students define and analyze the stakeholders and associated risks regarding their serious game suggested for the festival. The professor, tutor has an important role as a coach, helping and encouraging students to continue and to persist in order to achieve the team objectives. From the first session until the end of the project, students complete tests and identify, using an evaluation scale, their emotional, social and personal competencies.

In the second phase, the part “knowing yourself by self” in the IDEFI program has been approached by a Mindfulness program called ACT’ – Acceptance and Commitment Training. Based on psychology and positive education approaches (Kabat Zinn, 1982 and Hayes, Strosahl, & Wilson in 1999), ACT’ objective

is to help students to find a psychological flexibility and to stop fighting against their painful thoughts, emotions, memories and perceptions, or to learn how to cope with disagreeable thoughts, emotions and sensations, in order to work at canceling the barriers in useless or counter-productive behaviors for the learner and to reset themselves in action for things that really matters. The 12 hours ACT' workshops envisage the development of psychological flexibility through six sessions articulating six central cognitive processes: cognitive diffusion, acceptance, contact with the present moment, observing the self, values, and committed action.

In guidance, no conceptual framework has been advanced to guide the work of practitioners and researchers, values are widely ignored by both groups. But, in the IDEFI program, "Values" have been a part of ACT' program at helping students to define their values which are the most important guiding principles that help set priorities in students career and life. Precisely, the cognitive diffusion is the learning method to reduce the tendency to reify thoughts, images, emotions, and memories ; Acceptance allows thoughts to come and go without struggling with them. Contact with the present moment which works on the awareness of the here and now, experienced with openness, interest, and receptiveness ; Observing the self by accessing a transcendent sense of self, a continuity of consciousness which is unchanging ; defining values i.e discovering what is most important to one's true self ; Committed action is about setting goals according to values and carrying them out responsibly.

The experimental research protocol were based on traditional design: two groups – one experimental and one control groups with two phases of testing – pre-post-tests and the control group for deontologic motives, received the training after the end of

the research data collection, after the end of the courses with the experimental group. This program has been running since 2014 and more than 500 freshmen students of sciences of education have been trained since then. The sample population in this paper consisted of a total of 132 students, (valid data: 97 students). All the participants were split in 8 groups, 4 groups as experimental groups (XP GP) and the 4 others as control groups (Ctrl GP). The students groups were not set up in a random selection but according their schedule availabilities.

Research linking coping and emotional competencies with students' achievement and wellbeing has mainly employed self-report Likert-type rating scales of emotional intelligence or emotional quotient. In our current research, we use different scales and Likert-type self-ratings to measure freshmen students EK progress related to the instruments and tools: the Trait Emotional Intelligence Questionnaire (TEIQue), the Emotion Regulation Profile-Revised (ERP-R) ; ACT measurements and Mindful Attention Awareness Scale (MAAS) predictive of, a variety of self-regulation and wellbeing constructs ; The Acceptance and Action Questionnaire 2 (AAQ 2); Depression, Anxiety, Stress Scale (DASS); the Academic Motivation Scale – AMS scalint three types of intrinsic motivation (intrinsic motivation to know, to accomplish things, and to experience stimulation), three types of extrinsic motivation (external, introjected, and identified regulation), and amotivation, and the Generalized Self-efficacy Scale which assesses a general sense of perceived self-efficacy. A qualitative data collection has been implemented to get a comprehensive overview of the added value of the IDEFI program for students regarding their professional work engagement and involvement.

3. RESULTS

Statistical data were analysed with SPSS software program using T-test and analyses of variance (ANOVA) in order to identify differences between experimental and control groups and participants' score changes after the training program (before the training T₁ and after T₂). It came out from the data analysis that several positive changes occur among students. To synthesize, students up-regulate more positively their emotions' irruption and increase their empathy, but even they demonstrate a higher score of anxiety and stress on the T₂ test, it means as found in other research, that students start to know themselves better and their resource ; thus, according this accurate knowledge, they face more realistically stressful situations and then might be able to handle in a more efficient way their level of stress and to manage it properly. It confirms the importance of coping strategies that the person's efforts mobilizes to remove, reduce, or manage threatening events or situations or appraised as challenging or stressful (Lazarus & Folkman, 1984). ACT' works at modifying cognitive appraisals of potentially stressful stimuli which are critical in coping processes, as are the resulting emotions. Ideally, adaptive coping must lead to a permanent problem resolution with no additional residual outcomes, while maintaining a positive emotional state.

Precisely, evaluation-focused coping, in problem solving, exercised in ACT', is a strategy of choice when the source of stress is unclear or when little can be done to eliminate the stressor or when there is a lack of knowledge on about how to modify the stressor (Lazarus, 1993). Previous research suggests that emotional self-awareness and regulation are clearly linked

with academic achievement. Precisely, as Pekrun and al. (2004) and MacCann and al. (2011), we observe in our research that students who know how to regulate their negative emotions, seem to be less impaired by negative emotions in assessment and learning situations. Depending on the degree of emotional regulation competencies they master, such students seem to be able to generate positive emotions that facilitate performance.

Also, using group work as a methodology of learning subjects, it allows not only knowledge transmission but also develops students self-awareness, self-confidence, social collaboration and Other's acceptance; competencies that are more and more required in different learning environments but above all at the work place. Particularly, emotional regulation and management have been linked with better social relationships, and with students who are better able to maintain their social relationships as required for effective group work (Lopes, Salovey, & Straus, 2003).

Developing students' emotional capital using those two tools, project management and mindfulness program, promoted emotional competencies, fruitful at making connections and maintaining social relationships which those latter are important not only for students performance at gaining high grades on group or individual assessments, but more generally for maintaining social support and well-being in the educational environment as shown by Linnenbrink-Garcia and al. (2011) and for labour market and career readiness (Gendron, 2004, 2017).

Students' wellbeing and success, both in private and social spheres, beyond its economic and social and human capital, depends on their emotional capital. This later capital is crucial in self-adaptation to changes in society and at the work place.

Developing emotional capital represents a personal, professional and organizational asset that helps people to act on them-selves, and react and adjust themselves to their environment and organizational changes. The main and significant outcomes are presented below.

Despite the lower scores in emotional regulation and self-control from the characteristics of the experimental group before starting the training compare to the control group, the EK training program outcome suggests promising changes. Indeed, regarding emotion regulation, at the end of the program (T₂), the purpose of ERP-R was to evaluate the emotion regulation of students and to determine how they usually react in different emotional situations.

Table 1.
Main significant outcomes

Variables	N	Pre-test	Post-test	Difference	Z	Sig.
ERP_TOTAL	60	17,9	20,01	2.1	2,767	0.006*
ERP_POSITIF	60	13,15	14,3	1.15	2,284	0.022*
ANXIETY	60	10,55	12,84	2.29	2,194	0.028*
STRESS	60	12,07	15,62	3,55	2,702	0.007*
EMPATHY	60	4,76	4,94	0.18	2,347	0.019*

Namely, the ERP-R not only provides information about how a person regulates his/her emotions, but it also highlights the regulation strategies used. Statistical analysis identified that after the EK training program (T₂), students from experimental group have a higher score referring to a better ability (m=20,02) than those from the control group (m=17,9) on up-regulating positive emotions (Z=2,284, p=0,022) and on concentrating in the positive side of the situation even if there are some obstacles (Z=2.851, p=0,004).

For the experimental group, we also identified a positive correlation between *up-regulating positive emotions* ability and the subscale *optimism* of TEIQue ($r = 0.306$; $p = 0.018$). This correlation confirms the outcomes on optimism from positive psychology research: optimists are people who expect good things to happen to them and the difference between optimists and pessimists is the way they approach and cope with adversity. Optimism defined, as the persistence in pursuing goals despite obstacles and setback, is not only a state, but also can be learned and developed. In TEIQue, *optimism* is linked to wellbeing, albeit in a forward-looking way. High scorers look on the bright side and expect positive things to happen in their life. Low scorers are pessimistic and view things from a negative perspective. They are less likely to be able to identify and pursue new opportunities and tend to be risk-averse. Along with happiness and self-esteem, this scale reflects students' general psychological state at this point in time.

4. ANALYSIS AND DISCUSSION

The IDEFI program with its collaborative active learning approach provides a way of being able to know and understand students' themselves and their preferred behavioural style how it affects the way they react to different people and different situations and their decision making and choices. It also gives them an insight into how others understand the world, allowing them to work more constructively with a range of different people. This self-understanding and self-awareness can help students make better choices about their individual approach to their learning and when working in groups. According to Johnson

and Johnson (1986), there is persuasive evidence that cooperative teams achieve at higher levels of thought and retain information longer than students who work quietly as individuals. The shared learning gives students an opportunity to engage in discussion, take responsibility for their own learning, and thus become critical thinkers (Totten, Sills, Digby, & Russ, 1991) involving the three components of successful learning. Indeed, cognitive, affective, and volitional components of goal-oriented motivation, defined in the learning process equation have developmental aspects and explain students academic performance and career guidance satisfaction. The pedagogical approach employs meaningful and intentional activities that not only provide greater agency to students but also require thought and reflection about the learning taking place (Horton and Freire, 1990). Examples of active learning range from teams work and mind mapping to project based and learning (Russell, J.D. et al, 1995). The aim is to create a learning relationship among the student, staff faculty, lecturers, the material and the spaces, that requires engagement and reflection. It led to inquiry-based and discovery learning models. The main idea here is that students learn best when they can see the usefulness of what they learn and connect it to the real world. The program provides opportunities for learners to think critically about content through a range of activities that help prepare learners for the challenges of professional situations.

Regarding “knowing yourself”, the meditation practice (Gendron, 2011) via the ACT’ mindfulness program was designed to help participants gain more insights into the workings of their mind without reacting to it. Skills that the participants learned is how to identify and classify the “inner parts” of their own psy-

che; for example, their “inner critics,” “managers,” “protectors,” “helpers” or “optimists.” These may also include “happy parts,” “fear parts” or “vulnerable parts”. To awaken the self-acceptance, self-love and self-expression makes it possible to connect consciously, honestly and deeply with the rest of life and that participates to success. Specifically, as young people needs to imagine possibilities in their lives, set attainable goals, plan routes to those goals, systematically and consistently put goals and plans into actions, practice self-observation, reflect on results, and manage emotions ... Combined with a positive education perspective, some IDEFI exercises works at training students’ mind to assess situations in a positive way. It obliges to think about their own “values”, (areas of personal, couple, family, work values, q health, welfare, education life). Those experiences are the most profound influence on self-efficacy, which subsequently predicts future success and well-being. While goals associated with these latter paradigms are deeply enmeshed in schools today (e.g., basic skills, critical thinking), Barell (1995) proposes that helping students develop the conative attitudes and skills associated with self-direction and personal efficacy is one of the most critical tasks presently facing parents and educators as those skills relates to emotional capital formation which refers gather social and personal emotional competencies, as transferable and transversals skills required and strongly appraised and appreciated in jobs nowadays.

Finally, the IDEFI program finally develops emotional capital which prepare students for the future emotional works and jobs, particularly future educators and teachers’ jobs. Precisely, using these two approaches, the objective is to develop trainees social and personal emotional competencies such as a bet-

ter self esteem, self knowledge and relation with the others as empathy, as conflict management... and its return and impact on trainees' well-being, personal and social emotional competencies and performance. The approach ACT' involves a higher level of personal part of emotional competencies. This part of developing emotional capital is based on workshops on acceptance and engagement and practical exercises of mindfulness. In the low stakes activities students have to face-to-face work in teams which engage students in class including: think-pair-share, mindmaps, and project management. In the high stakes activities, the following more structured strategies require greater levels of planning and design, and we use the European PIA project management tool (). Students using this methods for learning went through collaborative learning, case studies, peer learning, enquiry based learning, problem based learning, and project based learning.

From an interdisciplinary approach combining sciences of education, economic of human resources and positive psychology, it shows that emotional capital, can improve the wellbeing and performance of trainees, future educators and teachers, that contributes to ensure sustainable and benevolence education and balanced person development and professional skills.

To summarize, this research aims at helping students to copy with the stress of their first university year during the guidance career unit of education by developing students emotional capital using tools from collaborative active learning and positive psychology, as Acceptance and commitment training (ACT') and Project management tool (PIA2). The main outcome confirms previous findings that student' performance and wellbeing are related to social and emotional regulation to the university

environment (Goetz and al., 2005; Zeidner and al. 2009). Educational performance and success requires self-regulated learning practices, sustained effort, managing time demands and academic stress, as navigating in new social landscapes, which implies an appropriate emotional capital (Gendron, 2004). The IDEFI program participates to flexibility and personal development. Engaged in action via collaborative active positive pedagogy, based on core values and overcoming psychological barriers of changes, students discover flexibility, an essential factor to live better today and for tomorrow life and work readiness.

Also, emotional capital impacts health and well-being. Proficiency in emotional capital includes skilled management of emotions, external situations and relationships, and promotes a better mental health for students, especially a higher resilience to stress by a better self-awareness. Thus, developing emotional capital can be helpful to students but also teachers working in emotional contexts and works; here, that's the case for freshmen students expose to a new life facing stressful changes.

5. CONCLUSIONS AND SUGGESTIONS FOR POLICY MAKERS

Knowing yourself by Self and through Others, Emotional capital and the equation of the “Successful Learning Process” or “Successful Learning Equation” are core concepts supporting IDEFI program. Here, guidance career training has been seen as an integral part of our teaching, something that is exciting and helps unlock students' potential and helping students resilience by developing their emotional capital which is related to transversal and transferable competencies.

Career guidance is primarily concerned with realising the aspirations and potential of the

individual. However, career guidance also offers considerable social and economic benefits for a society. To relate to the Oecd definition, career guidance can have substantial benefits for the economy by supporting individuals to enhance their capacities in ways that contribute to enhanced jobs, skills and growth. It can be argued that career guidance enhances individuals' human, social and emotional capital and explore the way in which these work through the economy to impact on macroeconomic outcomes. This focus on the economic outcomes should not be seen as diminishing the wider benefits that career guidance can deliver in terms of self-actualisation, job satisfaction, social equity and a range of other personal and social outcomes. This suggests that the French government should re-examine current career guidance policy and consider how it can best and more often implemented in universities curriculum to maximise the afore mentioned economic benefits. the evidence on the economic benefits of career guidance. According the OECD's definition of "career guidance" uses in our paper, this definition is broad and encompasses a wide range of activities that take place within the education system and beyond it. Indeed, although career guidance is primarily concerned with the individual it also offers major social and economic benefits (Hooley and Dodd, 2015) as career guidance contributes to a range of individual outcomes which influence a number of primary and secondary outcomes which in turn lead to macro-economic benefits. It is these benefits that justify public investment in the area. And regarding the social and personal emotional competencies that guidance underlines and mobilises, those new skills are trans-

versal and transferable skills which matters a lot nowadays in emotional work and jobs and especially to prevent psycho-social risk at work. It refers to a real emotional capital.

Thus, the emotional capital is a singular capital in which people, institutions such as educational institutions as universities and societies should invest in it, because of its economic, social and personal returns as it enables people development' sustainability in nowadays lifelong learning perspective, and as it can lead to less individualism and toward a higher personal and society individual' engagements, to the respect of the great power of education and of work values in personal-socio-economic environments (at home, communities, schools, and work). And at the macro-level, it participates to social cohesion and citizenships' responsibility and commitments (Gendron, 2007). Emotional Capital is a real and effective Personal, Professional, Social and Organisational Asset.

To end, the most fundamental reason for education is to empower people to succeed in their quest for a meaningful career path. For that to happen one would imagine that Career Guidance would be the most important programme in university to achieve this goal and some further research on its economics return in a broad sense will be a benefit.

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How Can Vocational Learning be Sustained in Contingent and Precarious Work?

Karen Evans*

Abstract: This paper aims to draw attention to the imminent publication of the Routledge book 'How Non-Permanent Workers Learn and Develop' (Bound, Sadik, Evans and Karmel 2018). The research underpinning the book was initiated as part of a Singapore–UK collaboration. This paper outlines some of the perspectives developed and makes connections with recent inquiries into casualisation of work in the UK (Taylor 2017). It reviews connections between European Union and International Labour Organisation perspectives (see for example EC 2016; ILO 2016) on the growing prevalence of non-standard work and the challenges this presents in contrasting economies and societies. In particular, the limited attention that has been given to the learning and development of workers whose employment is characterised as 'precarious' or 'contingent'. Examples from specific sectors (including creative industries sector, and continuing education and training sector) have been used to explore the question of how non-permanent workers learn and develop in practice. The methodological approach draws on Ragin's (1991) comparative sociological approach in aiming to develop an extended dialogue between ideas and evidence

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yielded by UK and European-Asian research into how working lives are sustained in contingent work. The paper connects findings from international level surveys in Europe and Asia (Brown, Lauder & Ashton 2011; ILO 2013; McKinsey 2016) to micro-level data yielded by participants experiencing particular forms of contingent work in Britain (see Evans et al 2009; Lahiff and Guile 2016; Taylor 2017) and Singapore (see Bound, Sadik, Evans and Karmel 2018). The paper gives particular attention to use of prior and new knowledge, how work-related networks and relationships are developed and how roles are negotiated.

Keywords: workplace learning, adults, contract-based work, precarious work, affordances for learning, practice-based learning.

1. INTRODUCTION

The rise of non-permanent work and non-traditional work patterns is a global phenomenon. As expectations of a job for life, dependable benefits, steady work rhythms and union protection are being eroded in the advanced industrial economies, work patterns based on informal and part-time work; short term contracts; self-employment and freelance work are expanding. This growth is characterised by both risks and opportunities for those who are increasingly caught up in these work patterns. Some perspectives focus on the social and economic risks associated with polarisations between the highly paid who can invest in their own future security and those caught in the revolving doors of short-term contracts and low pay, with precarious working lives and few safety-nets. Others focus on the opportunities created by new working patterns, pointing to flexible work as a conve-

nient cultural choice, particularly among young adults, while imagining future prospects for realignment of labour with new flexible modes of production, as ‘friction-free capitalism’. Social commentaries pragmatically analyse the policy options, based on the empirical facts of the increasing incidence of precarious or contingent work. Whatever the perspective, most books on the subject approach this phenomenon from the standpoint of Western advanced economies. ‘How non-permanent workers learn and develop’ is unique in exploring the realities of precarious and contingent work from the standpoint of an advanced Asian economy rooted in a version of the developmental state model that characterises much of the region. The analysis can be connected, though a dialogic approach, with the findings of the 2017 UK inquiry into the casualisation of work in the United Kingdom, entitled ‘Good Work’.

Conceptually, the ‘How non-permanent workers learn and develop’ moves beyond the characterisations of a new ‘precarariat’ trapped in highly insecure work patterns, to develop the notion that both work and workers are continuously changing across and beyond traditional boundaries, creating new configurations of contingent and precarious work. This approach enables a new, empirically-based exploration of the challenges workers have to negotiate in learning to do good work, developing occupational identities and striving for sustainable working lives. It also enables a constructive exploration of what public policy, in an advancing developmental state context, can and should do to support and protect workers in securing futures for themselves and their families. It considers how strategies for continuing education and training can move towards more inclusive and progressive approaches to supporting learning and development

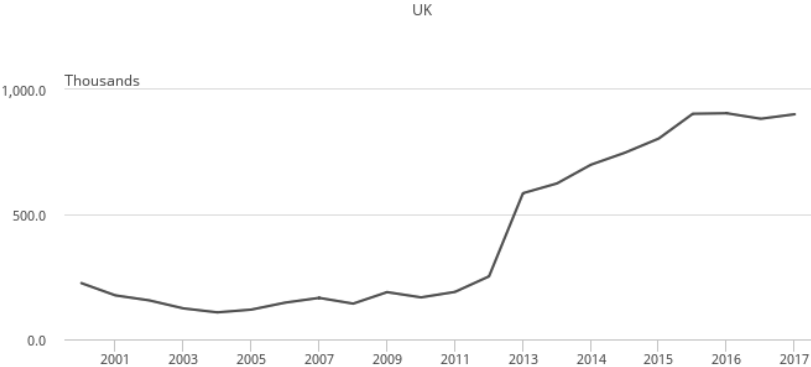
that have better fit with the realities of transmutable work and the changing composition of the workforce. The conclusions have wider salience for public policy responses to this global phenomenon in both Asian economies and advanced industrial economies of the West.

This wider salience can best be understood by reviewing the connections between European Union and International Labour Organisation perspectives (see for example EC 2016; ILO 2016) on the growing prevalence of non-standard work and the challenges this presents in contrasting economies and societies. Much attention has been paid to ways in which competition has led to changes in the way work is organised and to ways in which these changes at work are experienced. New forms of work associated with fragmented, smaller, high tech organisations combined with an increase in use of short term employment contracts in many advanced economies are making insecurity one of the dominant realities of the work of the future. Patterns of employment are gradually diversifying in countries whose previous development in the twentieth century established the security of permanent work as the norm. Meanwhile, for other economies, insecure, contingent and precarious work has been the way of life for much of the population.

Of course, both Europe and Asia contain highly differentiated economies. Singapore, in which segmented labour markets attached to global economy co-exist with local indigenous forms of employment provides a telling case, not only in the context of Asia (Soong Hee Han) but also for many other countries experiencing these tensions and trends. For the purposes of this paper, UK represents, the growing phenomenon of contingent and precarious forms of employment in a market-led economy.

Recent statistics from the Office for National Statistics, ONS, show the increases in one of the most insecure forms of employment contract, the ‘zero-hours’ contract in which workers are not guaranteed a minimum number of work hours from week to week but work according to demand. This form of contract is widely in use in the so-called ‘gig economy’.

Figure 1: Number (thousands) of people in employment reporting they are on a zero-hours contract, October to December 2000 to October to December 2017



Source: Labour Force Survey (LFS) - Office for National Statistics

Figure 1 shows number (thousands) of people in employment reporting they are on a zero-hours contract, 2000 to 2017. ONS sample size-5,000 businesses; LFS sample of individuals from around 40,000 households and around 90,000 individuals per quarter.

Figure 2:
Use of zero=hours contracts

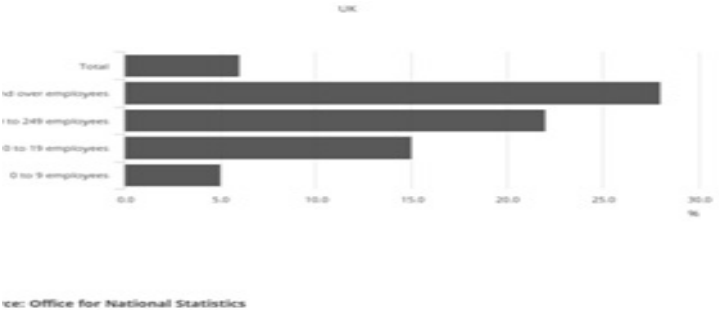


Figure 2 shows the extent to which UK companies of various sizes make use of zero-hours contracts. Over a quarter of the largest companies make some use of zero-hours contracts.

Figures 3

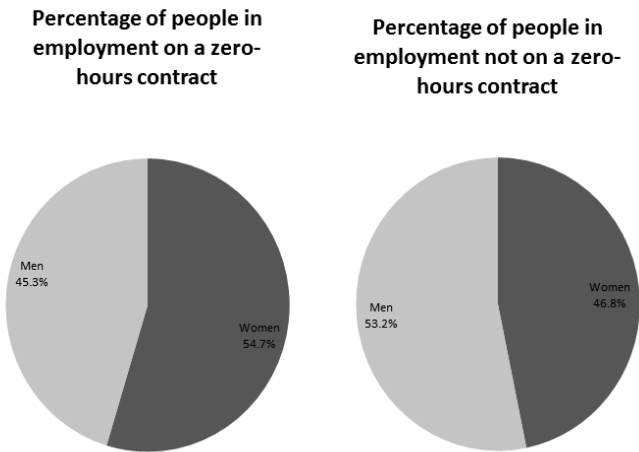


Figure 3 compares the percentages of workers on zero-hours contracts with percentages of workers on other forms of employment. Zero hours contracts are more likely to be held by women. The ONS data also show that migrants and young people are more likely to be employed on zero-hours contracts.

The UK can be considered a ‘telling case’, in representing the increase of non-permanent work in a European market -led economy. Singapore also has growing incidence of non-permanent work. It is comparable with UK in having at least 20% of the workforce in non-permanent forms of work, in which the following forms are included: fixed term contracts; casual work; zero-hours contracts / gig economy work.

The growth of ‘free-lance’ and contract-based work internationally generates a need to understand how experiences of these forms of work contribute to or constrain personal and professional development, and how the learning of workers can be supported. These are the questions we have addressed in *How Non-Permanent Workers Learn and Develop*, by Bound, Sadik, Evans and Karmel, 2018). Further research collaboration between the author and the Singapore-based research team is developing a new European-Asian analysis of the work and learning of free-lance and agency workers.

Research questions:

- How does the experience of free-lance and contract-based work in contrasting contexts contribute to or constrain the learning of workers?
- How can the learning of non-permanent workers be supported and enhanced?

2. THEORY

Theoretical perspectives on learning and development of non-permanent workers can be compared by adapting the grid proposed by Evans 2010, see also Wolf and Evans 2011. This grid contrasts the dominant perspective of human capital accumulation with the social practice perspective. Both perspectives offer lenses that focus on the learning individual and the social organisation of learning, offering contrasting accounts of the relationships between them.

	Learning and Development of NPWs as Human Capital Accumulation	Learning and Development as Social Practice
Focus on the learning individual	Quadrant 1 Non-permanent workers perceived as requiring defined set of technical skills, the absence of which can impact negatively on an individual's economic and social opportunities.	Quadrant 3 Emphasises the social context of using capabilities, often framed by relativist and hermeneutical perspectives.
Focus on social organisation of learning	Quadrant 2 Emphasises shaping and organising education and adult learning 'provision' for socio-economic ends such as increased productivity, social mobility.	Quadrant 4 Emphasises contexts, spaces, environments, and mediational means for learning; communities of practice; informal and 'everyday' learning;.

For example, the 'Good Work' (Taylor 2017) review was premised on the view that all work should be fair and decent, with scope for fulfilment and development. Taking a human capital accumulation perspective, the review sees 'provision' as key to

‘delivering’ solutions that enable people working in atypical or casual work to obtain, improve and evidence skills and experience over the course of a working life.’ The solutions envisaged propose a strategic approach to ‘cover’ formal vocational training, ‘on the job’ learning and development, lifelong learning and informal learning outside work, linked to the development of life-time individual learning records and a national framework of employability skills and encourage stakeholders to use this framework.’ (Taylor 2017 in ‘Good Work’). The social practice perspective developed in ‘How non-permanent workers learn and develop’ has focused, by contrast, on the social contexts in which such workers use their capabilities and come to identify with their roles and future possibilities. The research draws on Bauman (2005) in showing how individuals are increasingly positioned to lead a ‘liquid life’. Expertise is deployed in relational and multifaceted ways, cutting across areas of specialisation. Workers develop multiple identities according to their positioning and their contributions to different work teams. An emphasis on capabilities and life directions is apparent in the work and life negotiations of the liquid life course. Maintenance of internal points of reference and a continuous internal life appear important in navigating fluid work opportunities, but casualties of contract-based work are likely to occur where workers lose a sense of continuity and direction and are unable to access support that could help them. The literature on learning and reflexivity in figured worlds often acknowledges, but struggles to keep in view, the various forms of knowledge (personal, procedural, ethical, propositional) that the contract-based worker draws on. The paper goes beyond the ‘liquid’ view of learning of free-lance and contract-based workers by focusing on

continuous multiple knowledge recontextualisations through which contract-based workers become knowledgeable practitioners, building on the concepts and perspectives of Evans 2015.

Methodology and methods

This paper has its origins in an exploration of the experiences of free-lance and contract-based workers in a literature-based review of connections between European Union and International Labour Organisation perspectives (see for example EC 2016; ILO 2016). This literature highlights the growing prevalence of non-standard work and the challenges this presents in contrasting economies and societies. Insights from international level surveys in Europe and Asia (Brown, Lauder & Ashton 2011; ILO 2013; McKinsey 2016) can be reviewed in the light of micro-level data yielded by participants experiencing various forms of precarious and contingent work in Britain (see Evans et al 2009; Lahiff and Guile 2016 Taylor 2017) and Singapore (see Bound et al 2018). The limited attention that has previously been given to fundamental issues of how non-permanent workers learn and develop is highlighted, leading to the development of the research questions.

The methodological approach is drawing on Ragin (1991)'s comparative sociological approach in aiming to develop an extended dialogue between ideas and evidence yielded by UK and European-Asian research into how working lives are sustained in contingent work. In this paper, I summarise some new insights that the inquiry into 'How non-permanent workers learn and develop' (Bound, Sadik, Evans and Karmel 2018) contributes to this extended dialogue, based on evidence and

analysis from extended interviews with 97 workers in contingent and precarious forms of work and discussions with a wide range of key informants from stakeholder groups and in selected occupational 'reference' groups from creative industries, continuing education and training, and occupations commonly considered 'low-waged'.

These new insights feed into an extended discussion of how a deeper understanding the continuing learning and development of free-lance and contract-based workers entails recognition of the significance of continuous multiple knowledge recontextualisations. This knowledge dimension is central to the exploration of how the experiences and conditions of work can contribute to, constrict or undermine the learning of these workers. By focusing on the contextualised nature of learning, the recontextualisation of knowledge and the processes by which contract-based workers become knowledgeable practitioners (Evans 2015), the paper attempts to shed light on the practices that support and enhance learning in contrasting contexts, as a point of departure for future Asian-European comparative study.

3. RESULTS: NEW INSIGHTS GAINED FROM EXTENDED DIALOGUE BETWEEN IDEAS AND EVIDENCE

The inquiry has generated at least three contributions to the advancement of our understandings of the learning and development of non-permanent workers. These contributions, which are elaborated in Bound, Sadik, Evans and Karmel (2018), offer new insights into

- dispositions towards learning and development
- how integrated practice leads to knowledgeable practice
- affordances for learning and development.

Previous studies of precarious and contingent workers have typically constructed typologies to capture and characterise the variations in the situations of those found to engage in these forms of employment. For example, a European-wide typology of job-changers (Hendrich and Heidegger, 2001) previously revealed considerable variation in experiences, positive and negative, and associated competences, according to how people are positioned in the labour market and in the social structure. These considerations are relevant to workers involved in short-term contract-based forms of employment, for whom 'job change' is ever present feature of working life. The types identified were broadly as follows:

Advancement-oriented, work-centred individuals:

'Labour force entrepreneur' frequent job moves geared to advancement; high awareness of key competences and 'knowhow'.

Precarious occupational biography in low graded jobs:

Awareness of social competences for adaptation to new work situations; little confidence in ability to draw on other experiences or skills in new work situations, or recognition of their relevance, both males and females

Return to the labour market after occupational breaks for personal/family reasons

Predominantly stability oriented females; awareness of competences gained outside work, but also knowledge that these are seen as equipping them for helping/caring occupations or low graded jobs (seen as women's work?!);

In or aiming for self-employment

Both males and females: high awareness of wide range of competences gained and exercised through experience, used to pursue business opportunities, in ways that do not rely on accreditation by others.

High skilled professional career job changers

Usually entails moves to different roles, eg advisory or consulting with a focus on updating and regaining confidence and networks. Wider competencies gained outside work are valued.

More recently, McKinsey (2016) constructed categories reflecting degrees of economic freedom, differentiating between workers who were labelled as 'Free agents'; 'Reluctants'; 'Casuals' and the 'Financially Strapped'. This approach tends to align with human capital and rational choice perspectives in assigning people to categories. Our exploration of the learning and development dimensions of the experiences of non-permanent workers has aimed for an approach which avoids labelling but acknowledges the changing situations, circumstances and priorities of individuals over time. Rather than assigning to categories tied to assumptions about types and trajectories, Bound et al (2018) have identified two dimensions – Opportunistic/Purposeful and Broad/Contained that, taken together, capture

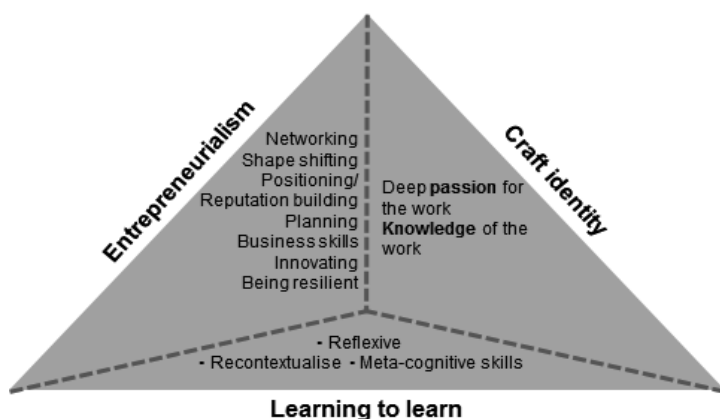
variations in dispositions to learning and development that can and do vary over time: These dispositions are expressed in patterns of activity that can be characterised as:

- Opportunistic and Broad
- Purposeful and Broad
- Opportunistic and Contained
- Purposeful and Contained.

Opportunistic orientations take on opportunities where they can be found, scanning over a broad field. This orientation often means fragmentation. It can also be innovative or create chances that might be missed in a more planned approach. Purposeful and broad orientations will be more selective according to plans and goals but need sufficient breadth to ensure chances are not missed. Opportunistic, contained orientations will take on opportunities as they arise within a narrowly self-defined limits, which could be geographical or according to the person's individual situation. The employment risks of self-limiting might be offset by other advantages in personal life, and well-being or fit with other higher priority activities (eg student work, family life or other employment). Purposeful and contained orientations may be motivated by a desire to build relationships with one or two contracting organisations, which could have some benefits as well as higher vulnerability to job loss. There is thus no labelling of individuals according combinations of dispositions to learning and development, and how non-permanent workers are disposed towards learning and development changes as circumstances and contexts change, continuously over time.

The second key construct, that of **Integrated practice** cap-

tures the idea of *identification* with both the craft and entrepreneurialism, with development towards knowledgeable practice dependent upon iterative and reflexive learning. The dimensions of Figure 4 do not equate to sets of skills and the dispositions. The dimensions of integrated practice are brought together as a cohesive, co-ordinated set of actions and activities that are evident, to varying degrees in the working practices (of ‘free-lance’ /contract-based workers). Finding ways to support integrated practice in initial VET and CET leads to the development of knowledgeable practice. The role of educators is to support individuals in fields characterised by non-permanent work (eg creative, hospitality, education, towards becoming knowledgeable practitioners.



Source: Bound et al (2018)

The research has drawn attention to the integrated nature of occupational practices in which craft, learning to learn, and entrepreneurial capabilities are developed and practiced vari-

ously according to the context, disposition and personal circumstances. In *How Non-Permanent Workers Learn and Develop*, we show how it is not the technical skills alone that makes a crafts person, or even the mastery and identification, but their combination with entrepreneurialism that generates the learning to learn and provides its material. Occupational practices in which craft, learning to learn, and entrepreneurial capabilities are developed and practiced vary according to occupational norms and the context, disposition and personal circumstances of the individual practitioner and can be facilitated in different ways through the design and delivery of ITE CPD and HE. .

The ‘putting knowledge to work’ framework of Evans et al. (2009, 2011) is used as an analytic framework to explore how these workers use their knowledge and capabilities and how they think and feel their ways into occupational and social identities as they move between different sites of practice. By analysing the practices and conditions as well as the learning dispositions that support free lancers’ and contract-based workers’ learning and development, the research has aimed to identify fresh ways of thinking about what it means to become knowledgeable practitioners in the contexts of contingent and precarious work. Building on Cavanagh (2012) and Fenwick (2008) gendered aspects of these processes and practices are kept in view.

In Initial vocational education and training in occupational sectors in which there is a high probability that graduates will be employed in non-permanent work contracts (eg creative industries where such contracts are the norm), learning activities can be designed to support the three aspects of integrated practice. For example, during placements, learners can collect stories from work colleagues about market practices, how col-

leagues have gained work and negotiated contract-based work; how mentorship has worked for them. They can be supported in identifying suitable role models and articulating what they learn from them. They can ask questions about challenges experienced workers have experienced and how they learn from them. They can make recordings of critical incidents to share and explain to others how and what they learnt from them, keeping in view the three dimensions of deepening craft, exercising enterprise and learning through the processes of inquiry, questioning and review. These kinds of learning activities, which are often part of educators' existing repertoire of approaches, can be combined strategically and explicitly in supporting learners towards the long-term process of becoming knowledgeable practitioners.

In continuing vocational education, the opportunities for learning and developing through integrated practice require particular affordances and supports. For workers joining organisational teams as agency staff, casuals, contract staff, freelancers, moving between assignments within an organisation or between organisations, entails continuous learning:

- workers have to learn to 'read' norms and expectations quickly and put their capabilities to work according to the situation.
- Non-linear process can involve meeting a multiplicity of performance expectations and requirements

Both depend on capabilities to use judgement to assess new situations, to bring those new situations under control. A quote from a video- editor captures the sense of fitting oneself to shifting environments expressed by many non-permanent workers.

As time goes by ... the more you come to an understanding that you have to change to fit yourself into different environment. There's no point in complaining that we don't have this and we don't have that. Every company we go to is very different and no company will change for freelancers. So you change for them, and not the other way around. So it was something that took me a long, long, long while to cultivate myself to be malleable. But it's a very precious experience.

The quality of the work assignments and environments fundamentally affects the learning:

- For non-permanent workers, development of capabilities depends most heavily on the quality of serial assignments and on networks to access personal sponsorship and opening of doors.
- Lack of quality assignments, in which the worker has to move from one exploitative, routinised or corner-cutting assignment to the next to sustain their income, potentially undermines and restricts capabilities' development and thereby a longer-term direction to their working lives: 'no trajectory, no career, no security'.
- Non-permanent workers who are regarded as marginal are rarely seen by organisations as a resource in solving organisational work problems, despite often considerable prior experience.
- Trade union support structures are at best only patchily available to non-permanent workers, often through mutual or co-operative enterprises.

- identity development takes place through serial engagements in practice; it is dependent to a greater degree on forging enduring relationships-in-action beyond assignments and practice engagements.

The nature of freelance work, as a subset of contingent work, seems to lead to a particular kind of identity, where these workers are constantly reproducing themselves as an economic resource. First and foremost they identify with their craft – camera, sound etc., then identify as a freelancer, illustrating the relationship between the technical, aesthetic and more generic skills and knowledge:

- Cameramen learn about the latest technology by reading the relevant manuals as well as viewing demonstrations on ‘you tube’. They also develop their sensitivity towards light and aperture through ‘trial and error’ and observing others. [CRAFT]
- ‘Helping each other out’ on site provide opportunities for practice and learning about other roles (e.g. lighting, key grip, sound) as well as watching and evaluating the potential for new team members. [ENTERPRISE]
- All these features entail the capacity to access knowledge and skills from diverse channels and ‘recontextualise’ it in a variety of work settings: [LEARNING TO LEARN].

Supporting continuous development of non-permanent workers can be looked at from both the perspectives of minimising risks and expanding potential. Ways of minimising risk for non-permanent workers can be viewed in individual and institu-

tional terms. Ways of minimising risk by promoting the earning potential of non-permanent workers by boosting their ‘personal capital, human capital and social capital’ (RSA 2015) concentrates disproportionately on gaining individual advantages through acquisition. Many non-permanent workers operate in poorer conditions with fewer protections than those typically experienced by employees in companies that have the support of human resource and safety systems. Technocratic solutions of enabling non-permanent workers to draw down elements of transferable skills and competences from an elaborated competence framework might appear to address the ‘problem’. But, views of non-permanent workers and their actual participation patterns among our respondents suggest the approach is wide of the mark. In Bound et al 2018 we show how across all the sectors in which we interviewed non-permanent workers, attending structured training within competence frameworks was described as an opportunity-cost involving both the cost of the course and loss of income while attending training.

Solutions have to respond to the contextualised preferences of non-permanent workers according to the functionings they seek, drawing on Sen 1993. Furthermore, continuing professional development also depends crucially on forging social relationships in the place of work, which for non-permanent workers have less significance than their personal and occupational for networks forged through connections.

The differences between the continuous professional development experiences of non-permanent workers and permanent workers can be seen more clearly when we consider the specific ways in which the workplace supports, directs and gives meaning to learning opportunities at work. The continuing profes-

sional development of workers that takes place in and through the workplace is intrinsic to the processes by which different forms of knowledge are continuously and iteratively put to work, as continuous professional development potentially enables non-permanent workers to become knowledgeable practitioners with a sense of who they are, a working knowledge of the occupational practice communities to which they belong to and confidence in the capabilities they can offer to the organisations that use their services. All these processes build, for both permanent workers and non-permanent workers, on pre-service education, training and experience. They are integral to becoming a knowledgeable practitioner. Whether a non-permanent worker or permanent worker in an organisation or in an established trajectory of development, these forms of continuous professional development are very relevant to all levels of the workforce, although this is often insufficiently recognised at the lower levels of the earnings distribution. For non-permanent workers, many of these development processes are not embedded in day-to-day organisational life but must be actively constructed – development takes place but presents additional challenges of how to sustain development and counter potentially de-skilling and dis-integrating experiences. In working life, integrated practice is intrinsic to the continuing professional development of non-permanent workers, with learning-to-learn and entrepreneurial capabilities integral to the active construction of the pathways to knowledgeable practice.

Knowledgeable practice is practice that is characterised by the exercise of attuned and responsive judgement when individuals or teams are confronted with complex tasks or unpredictable situations at work (Evans 2009, 2015. The knowledge that under-

pins knowledgeable practice is developed by forging connections between theory and practice. In the workplace, chains of recontextualisation are forged day by day as, for example, people are stretched and challenged at work and have to exercise judgement in making decisions and taking action. Seen in terms of putting different forms of knowledge to work, the challenges for non-permanent workers are how to cope with the continuous change and how to progressively develop their capabilities and work identity.

Knowledge is recontextualised, it is not static; it is context specific and the practitioner develops *knowing* in practice while moving between successive assignments of variable quality and navigating unpredictable organisational environments. When enacting a well-known activity in a new setting, an adaptive form of recontextualisation takes place as existing knowledge is used to reproduce a response in parallel situations. When the worker has to change the activity or its context in an attempt to make a response, a productive form of recontextualisation takes place as new knowledge is produced (Allan et al 2016). Continuing professional development for non-permanent workers depends in part on the extent in which they can use work problems as a 'test-bed', learning through observing, inquiring, acting and moving on. Progressive development of capabilities is dependent in part on what they can 'make of' different environments, finding tactical ways in which they can leverage greater control of their situation (including decisions on which assignments they turn down and why), using tacit skills, seeking mentoring and recognising the value and benefits of mutual peer support. Non-permanent workers, through developmental knowledge recontextualisations, come to self-embody knowledge cogni-

tively and practically. This is a process that is invisible, as it is difficult to detect and appreciate.

These processes tend to be better understood for non-permanent workers whose work is recognised as using professional, managerial or specialist knowledge and skills associated with extended initial education and training, as in creative sector and educational roles. They are less well understood for those non-permanent workers undertaking task-based forms of work that is held to be easily learnt.

For all contingent and precarious workers, access to support and guidance from industry educators who are independent of the employers to whom they are contracted. Such industry educators should themselves have recent and relevant experience of contingent and precarious forms of work. Industry educators performing these roles themselves need professional development that includes the development of capabilities in relational practice and in supporting knowledge recontextualisations.

Through supported learning and development, integrated practice can become knowledgeable practice. As well as focusing on access for non-permanent workers to learning resources and platforms that are independent of the employers to whom they are contracted at any one time, it is therefore necessary to deepen the debate about support for the learning and development of non-permanent workers by attending to:

- The variety of situations and learning dispositions of the workers themselves.
- The quality of the work assignments they undertake and of the work environments in which they are carried out.
- employment relationships between the worker and the

employer are regulated in the particular national and industry contexts, including entitlements and obligations.

Occupational affordances for the learning and development of contingent and precarious workers require four inter-dependent elements:

WORK: Opportunities for specialisation and quality assignments; availability of work that stretches and challenges and provides rich affordances for learning.

LINKAGES: Ease of entry and movement across sub-sectors of the industry, job roles and networks.

OCCUPATIONAL COMMUNITY PLATFORMS: Access to experts, networks, quality assignments, including through associations, non-profit organisations

VOICE: Institutional representation – union representation, combined with support in the welfare and pensions system, including new tax and welfare settlements that spread risks and provide supports such as tax breaks for training and development.

The research has revealed that workers in contingent and precarious work tend to value continuing professional development opportunities only in so far as the CPD supports the entrepreneurialism as well as the craft dimensions, offering opportunities to have discussions with more experienced workers and to prepare for being more able to work in different teams across different sites. These supports and purposeful reflexivity are hard to fit with demands of freelance work. Higher education programmes will be taken up if they work in tandem with occupational affor-

dancess and are perceived to have value in terms of integrated practice and the ability to recontextualise.

The interplay of the occupational affordances identified above creates fundamentally different learning and development spaces around non-permanent work.

- Vocational learning of workers in contingent and precarious work has to be understood in the contexts of work processes, practices and changes in productive systems.
- Different kinds of learning systems have to supplement each other in the development of opportunities for integrated practice.
- Episodes of integrated practice lead to knowledgeable practice, when adequately supported.
- Occupational affordances support learning through increasingly 'contingent' work
- Knowledge-aware mentoring & 'industry educator' development are priorities for sustaining vocational learning of contingent and precarious workers.

There are often major disjunctions between globalised policy assumptions about large-scale competence requirements and employees' (often larger and richer) capacities to develop their existing competencies and knowledge. Disjunction is exacerbated through adoption of narrowly defined skills agendas and vague assumptions about the needs of a post-industrial, 'knowledge economy'. The adoption of minimum competence frameworks often fails to take account of individuals' capacities to use and build on their existing knowledge in all its forms and the support needed to 'put knowledge to work' in meeting actual demands of the workplace.

The disconnects between standard competence-based frameworks and development needs of workers applies particularly in the case of non-permanent workers moving between tasks and assignments in fixed-term contracted for multiple employers. Even with a shift globally towards greater support and recognition for workplace learning, (now embraced by Singapore in Skills Future) the questions of whether, how and how effectively support for workplace-based learning of non-permanent workers assigned to fixed term project-based or task-based activities on short fixed-term arrangements pose particular problems with few obvious solutions. Ways in which the learning and development of these workers might be enlarged, or constrained, depends crucially on the strategic interplay of workforce development policies and the wider organizational and societal terrains created for worker development. Fragmentation of work in neo-Taylorist forms or movement between low-grade exploitative assignment threaten to limit or erode skills, as they did in when historically when Taylorist work practices became dominant and were then widely jettisoned in favour of more participatory work practices. The risks of skills atrophy in growing sections of working population are societal risks, when scaled up, and at odds with espoused aims for highly skilled and knowledgeable workforces.

And where non-permanent workers who seek development opportunities do so under the radar or beyond the scope of workforce development provision, it is important to understand the reasons for this. How can initiatives such as Skills-Future actually serve non-permanent workers' needs and preferences for forms of learning and development that work for their lifestyles and everyday life and work realities?

4. CONCLUSIONS AND REFLECTIONS

In exploring how contingent and precarious workers can become knowledgeable practitioners (Evans 2015), recontextualising multiple forms of knowledge and working their ways into occupational and social identities as they move between different sites of practice, the research shows how these processes are embedded in 'bigger' sets of relationships that mediate day-to-day work. Modes of industry engagement; professional, industry and workplace discourses; funding and industrial relations, the degree of industry susceptibility and the organisation and flow of production, along with workers' own sense of agency, influence learning and professional development.

To what extent do the spaces identified in this paper for learning and development enable the expansion of human capacities, and how are the participants themselves situated in the wider sphere of social, cultural and economic changes?

This paper ends with the reminder that, despite the sense of control that workers in standard, permanent forms of employment may derive from holding relatively secure positions in the labour force, work under Fordist production regimes was also often alienating and disempowering. As Fordist production regimes has given way to post-Fordist flexible labour and economic insecurity, alienation and disempowerment as well as aspiration take on different forms. Questions of individual responsibility often revolve around the flexibility, initiative and agency of workers linked to 'flexibility' portrayed as a positive virtue or set of attributes. There are western societies that are still inclined to the view of JS Mill that flexible behaviour in some way frees the individual, particularly the individual worker.

There are positive connotations ascribed to ways in which the language of flexibility is used. It implies desirable attributes of being open to change and adaptable in positive ways. But, according to Sennett (1998), the pursuit of flexibility has produced new structures of power and control rather than creating conditions that set people free. (p 47) Flexibility also has connections with 'resilience', a concept also linked with ideas of a human kind of tensile strength that is widely used in ways that put the onus on the individual to withstand external pressures including social injustices. A contrasting perspective has its roots in Lippmann's account of 'Drift and Mastery' (1914, updated 1985) in the construction of life and work careers. In place of the individual responsibility that lies at the heart of the 'individualisation' thesis, Lippmann focused on the ways in which careers develop through ability, agency and the interdependencies of mutual responsibility. In this account, work is seen as a long-term narrative and the development of character is achieved through sustained, organised effort. This resonates with the ideas of the responsible worker-citizen and contrasts fundamentally with the concept of the individualised 'flexible worker' competing for positional advantage in short term labour market manoeuvres, equipped with 'employability skills'. Lippmann also prefigured twentieth century arguments that the proper use of scientific, technological and professional knowledge helps people to develop a 'spirit of mastery' in approaches to their careers and the social world. Change is not to be suffered passively, but mastered through knowledge, capabilities and human agency.

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Promoting Equity, Inclusion, and Safety Through a High School Academy in the United States

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Abstract: The purpose of this study was to examine the school culture of a distinguished National Academy Foundation (NAF) wall-to-wall information technology (IT) high school academy. We were particularly interested in documenting how the a small learning community promotes equity, inclusion, and safety for all students. Following a case study approach, we found that the academy had a positive school culture. The academy culture embraced a unique attitude of acceptance for others. In addition, the academy was a safe place. The elements of the academy that were associated with a positive school culture included the open enrollment policy, wall-to- wall nature, small size, and student shared interests by focusing on IT as a theme. We believe the findings contribute to the literature on school culture and comprehensive school reform seeking to promote equity, inclusion, and safety though the high school career academy model in the United States.

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Keywords: career academy, career and technical education, school culture, school reform.

1. INTRODUCTION

Research has demonstrated that a key component of high school student achievement is the establishment of a positive and supportive culture of learning (Goldring, Porter, Murphy, Elliott, & Cravens, 2009). That is, schools that have positive and supportive cultures of learning tend to promote caring relationships where students feel valued, welcomed, and have a sense of belonging (Sanders, Allen-Jones, & Abel, 2002; Waxman, Padron, & Garcia, 2007). As such, strong and respectful relationships between adolescents and adults are characteristics of successful schools in the quest to facilitate the students' academic, social and overall development (Brand, 2004).

However, studies have revealed the challenges of building positive and supportive cultures in comprehensive urban high schools, particularly those that serve low-income and ethnically and racially diverse youth (Murphy, 2010). The difficulty typically stems from their relative large student populations and departmental silos. Further, racially diverse and low-income students, on average, attend schools located in high criminal activity neighborhoods (Fryer & Levitt, 2004; Land & Legters, 2002; Lee & Burkam, 2002). As such, the problematic community conditions tend to permeate the culture within schools creating an unsafe and non-conducive environment for student achievement.

What is less known is the culture that can be established in smaller high school academies, particularly wall-to-wall acad-

emies featuring career themes. Career academies are smaller learning communities featuring a college-preparatory curriculum with an embedded career theme requiring active partnerships with employers and postsecondary institutions. Career academies represent programs within high schools designed to increase student engagement and achievement while developing skills necessary to pursue further education or work (Orr, Bailey, Hughes, Karp, & Kienzl, 2004). A key condition of career academies is the integration of academic and technical content to increase rigor while building relevancy to students' career interests (Castellano, Stone, Stringfield, Farley-Ripple, Overman, & Hussain, 2007; Fletcher & Cox, 2012; Kemple & Snipes, 2000). By 2004, there were approximately 4800 high schools in the nation offering career academies in the United States (US) (Castellano et al., 2007). However, with the growing popularity of the career academy concept, the quality of implementation has varied greatly as schools and districts have rushed to join the bandwagon in the US.

To this end, there have been efforts to inform related implementation with the development of standards of practice by school networks such as the National Academy Foundation (Stern, Dayton, & Raby, 2010). As part of this movement, the National Academy Foundation (NAF) has sponsored academies since 1982. The NAF model seeks to promote college and career readiness, in the context of occupational themes and postsecondary preparation through customized support to help academies improve and grow (NAF, 2014). In this study, we focused on the academy model situated within an information technology (IT) theme. The NAF continuously evaluates their high school academies to certify their level of implementation based

on standards of practice. Academies are rated on five levels of implementation, using the following hierarchy from highest to lowest: distinguished, certified, model, open, and year of planning. The academy identified in this research was rated as a distinguished academy (the highest level of implementation to the NAF standards of practice).

The purpose of this study was to examine the school culture of a distinguished NAF wall-to-wall IT academy. In their study, we sought to document the nature of organizational structures and practices in high school wall-to-wall academies that cultivate unique school-level cultural meanings about students, implementation practices, and student achievement.

2. CONCEPTUAL FRAMEWORK AND METHODS

The framework for the study was supported by research on school culture, comprehensive school reform, and small learning communities and career academies.

A. CONCEPTUAL FRAMEWORK

School culture

The definition we used for school culture was the values, practices, and actions of school communities including students, teachers, administrators, parents, and other stakeholders. (Brown, 2015). School culture addresses: the ways these members relate to one another, group expectations about how work unfolds, and the outcomes of their work. Schools that lack a positive culture tend to have divisions among individuals or isolated groups; they often have a single leader who controls the

work of the school and commands a position of authority. On the other hand, schools with positive cultures have team members who are highly motivated and work collaboratively toward a shared goal (Louis & Wahlstrom, 2011). High schools with strong school cultures, according to Tichnor-Wagner, Harrison, and Cohen-Vogel (2016), share the following commonalities: “collaboration among adults, a community of learning among adults, supports for a culture of learning among adults, and a culture of learning among students” (p. 605). Essentially, school culture is a critical factor in effective school reform initiatives and serves as a catalyst for enhanced student performance and satisfaction among all school members (Brown, 2015).

Research on comprehensive school reform

Comprehensive school reform (CSR) is a holistic approach to school change that focusing on restructuring the complete school rather than fragmented or uncoordinated improvements (Borman, Hewes, Overman, & Brown, 2003; U.S. Department of Education, 2002; Waldron & McLeskey, 2010). The fundamental features of comprehensive school reform include: (a) a common vision and set of strategies, agreed upon by school staff, (b) high-quality professional development; (c) support within the school and from outside sources and, (d) evaluation of implementation and student outcomes based on measurable goals and benchmarks (Borman et al., 2003; Camburn, Rowan, Taylor, 2003; Waldron & McLeskey, 2010). That is, CSR requires that schools re-culture into a collaborative culture, the delivery of high-quality professional development and the development of strong, distributed leadership (Camburn et

al., 2003; Waldron & McLeskey, 2010). As such, a school necessitates teachers who agree with the CSR design premises, support from district leadership, and support from a design team in the form of clear communication and appropriate resources (Aladjem & Borman, 2006; Berends, Kirby, & Naftel, 2001; Desimone, 2000; Glennan, 1998). When implemented well, it has been reported that re-culturing into a collaborative culture promotes mutual trust among school staff, enhanced professional satisfaction, better instructional practices, improved student outcomes, and sustainable school transformation (Dufour et al., 2006; Fisher et al., 2000; Joyce & Showers, 2002). There is also evidence that CSR-schools have scored higher on achievement tests than non-CSR schools and have reduced the achievement gap when compared to previous reform models (Borman et al., 2003; Ross et al., 2001).

Small learning communities and career academies

Research on the size of schools has pointed to an ideal range of 600-900 students in a school setting (Lee & Smith, 1997). In this regard, it has been found that small schools showed reduced dropout rates, increased attendance, and higher graduation rates (Page, Layzer, Schimmenti, Bernstein, & Horst, 2002). In this context, the term “small learning communities” denotes a variety of school structures and configurations, including career academies, schools within a school, and magnet programs (Kuo, 2010). Students in small learning communities experience an increased sense of personalization and belonging, and lower levels of school vandalism (Page et al., 2002). In this context, the career academy model bridges the premises of school culture,

comprehensive school reform, and small learning communities. Career academies emphasize learning in specific occupational contexts to enhance the relevance of student experiences (Castellano et al., 2012; Hernandez & Brendefur, 2003). NAF Academies must have an established and shared vision of the school's direction towards meeting standards. NAF encourages cross-collaboration among teaching staff that enables students to make connections across subject areas and a coherence of curriculum, technology, support, and preparation that supports students in graduating college- and career-ready (NAF, 2017b). A rigorous curriculum, provided by NAF, is externally supported and informed by professional development, industry partnerships, and an advisory board (NAF, 2017b,c).

Based on reports including data from conclusive random-assignment studies, the career academy concept has demonstrated its potential to be a school reform strategy for promoting student success (Stern et al., 2010). According to Kemple (2008), participation in career academies has resulted in positive outcomes including increased attendance and academic course-taking, higher graduation rates, and lower dropout rates. Nevertheless, even though there is extensive documentation of the impact of student participation in career academies, research on the nature of organizational structures and culture supporting positive student experiences is rather limited.

B. METHODS

Research design

We followed a qualitative, case study design to explore the experiences of school personnel and community partners associated

with the implementation of the career academy model (Stake, 2006). The case study approach allowed the documentation of thick and rich descriptive information about the setting in which the high school NAF IT Academy was implemented for the purpose of identifying both factors and detractors (i.e., interpersonal and inter-organizational features) that moderated student experiences and outcomes. According to Stake (2006), “qualitative case researchers focus on relationships connecting ordinary practice in natural habitats to a few factors and concerns of the academic disciplines” (p. 10). Thus, in this project we studied a NAF IT academy (the case) operating within different contexts (i.e., community, school district) and at a distinguished level according to NAF standards of practice. The goal was to document how the NAF IT Academy was implementing NAF’s key elements, which focused on the following: (a) the organizational development and purpose, (b) the nature of curriculum and instruction, (b) strategies for supporting teachers and students, and (d) the external support system.

The case: Cascade academy

Cascade is a distinguished wall-to-wall NAF IT themed magnet academy, located in an urban area of Florida. The academy was comprised of 653 students and the school district had a population of 67,000 students. Students within the entire school district applied for participation in the academy based on a lottery system. The school did not admit students based on prior academic achievement, but instead had an open enrollment policy to ensure equity and inclusion of students regardless of backgrounds. All student participants were bussed to the school. The

ethnic and racial backgrounds of students at Cascade were as follows: 57% white, 24% Hispanic, 12% Black, 4% Asian, 2% Multiracial, and 1% American Indian. The gender makeup was 31% female and 69% male. Forty-two percent of the student population was economically disadvantaged.

The school had a Business Advisory Council comprised of business and industry, postsecondary, and community representatives. Members of the council served as mentors and guest speakers. They also provided job shadowing, paid internships, and fundraising opportunities. In terms of curricula offered, there were several IT pathways at Cascade Academy: computer science, cybersecurity, gaming, multimedia design, and network systems. All students were issued laptops at Cascade for the full four years of their schooling. In addition, students had the opportunity to earn an Associate of Arts degree in IT at their local two-year college through dual enrollment. Ninety-eight percent of seniors in 2016 graduated within four years. Also in 2016, 394 students earned industry certifications and 58 students completed paid internships within the IT sector.

We collected data through a five-day site visit. The academy principal agreed to provide access to the school and assist with the coordination of interviews with district and school administrators, school board members, IT and core academic teachers, school counselors, parents, staff, postsecondary partners, business and industry partners, and community partners. Data collected focused on the setting and characteristics undergirding the implementation of the NAF academy model and how that related to the school culture.

Data sources and participants

To inform the iterative process, we collected implementation data through the review and analysis of school and academy documents, classroom observations, and interviews with administrators, faculty, staff and school partners. Regarding document review and analysis, we collected documents pertaining to the structure and implementation of the NAF IT Career Academy. These items were assembled within an electronic binder, and included documentation and evidence of enacting the NAF's standards. Documents included in the electronic binder were organized around four domains: academy development and structure; advisory board, curriculum and instruction, and work-based learning. Example items included in the electronic binder were videos of students, brochures with information regarding school performance, and example student capstone projects.

During the site visit, the research team engaged in 18 classroom observations to understand the instructional environments, teaching and learning processes, and types and levels of assessments administered in the career academies. We used a protocol to document our observations. In addition, we conducted five off site visits (tours and individual interviews) with business and industry partners and We also conducted 77 semi-structured interviews with district ($n = 10$) and school administrators ($n = 2$), school board members ($n = 2$), IT and core academic teachers ($n = 17$), school counselors ($n = 4$), parents ($n = 9$), staff ($n = 3$), postsecondary partners ($n = 4$), business and industry partners ($n = 17$), mentors ($n = 6$) and community partners ($n = 3$). Individual interviews lasted approximately 60 minutes

in duration. Questions from the individual interviews related to the NAF model, the purpose of the program, curriculum and instruction, internal supports, and external supports.

Data analyses

All interviews were audio-recorded and transcribed verbatim. All data (curricular documents, classroom observations, and individual interviews) were analyzed using thematic content analysis to capture contextual factors underlying program implementation (Boyatzis, 1998). We then identified recurring themes using the following steps: (a) read the transcripts in their entirety to seize a sense of the whole in terms of how participants talked about their programs; (b) re-reading the transcribed interviews and demarcating transitions in meaning in the content of the text utilizing a lens focusing on school culture; (c) reflecting on the meaning units to examine revelatory research content gained within each transcript as well as across participants' experiences; and then (d) synthesizing the themes into statements which accurately represent the perspectives of the interview participants (Wertz, 2005).

3. RESULTS

Based on our data interpretations, we found that the high school academy environment cultivated an equitable, inclusive, and safe environment. Its small size, focal nature (IT theme), and the ability for students to self-select attracted a unique set of students who were highly engaged in the occupational theme and accepting of their peers who were different (because of [dis]

abilities, linguistic diversity, ethnic and racial background, and/or sexual orientation). All of these factors in concert contributed to the high school academy as a fertile ground for equity, inclusion, and safety.

3.1 A UNIQUE CULTURE OF ACCEPTANCE

During our interviews, we quickly found that the academy was a unique high school and had a culture of acceptance of all students regardless of backgrounds and differences.

Characteristics of a “geek”. During our interviews, we discovered a shared understanding among staff, community members, and alumni of the uniqueness of their student body. Participants often used the term “geek” and “nerd” to describe identifying characteristics of their student population. Carlos, a technology teacher jokingly explained, “We got great geeks, hacker wannabes, all kinds of computer savvy kids, with almost zero social skills. They’d rather hug the laptop, kiss the laptop. No dating skills.” Carlos explained that students were highly motivated to develop technology skills and they had profound interests in the world of technology. These motivations and interests often superseded social interactions. He spoke to the preference they had towards technology, resulting in missed opportunities to develop interpersonal relationships and hone social skills. Vicky, a technology teacher explained:

We have a field day that we do in the second half of [the Technology Conference]. Originally it was created when I first came on, because we wanted our students to interact with each other and get outside, and play kickball, and do fun things.

We'd have to say, You're not allowed to bring your laptops ...
to pep rallies ... no laptops ... the first pep rally I ever saw ...
Right? ... They're all sitting there on their laptops ... Here I am,
at a pep rally. I'm like – what is this?

Although there was an injection of humor in the teacher's statement, the concern was evident. Within the academy, the familiarity and acceptance of the geek stereotype was prevalent because of the nature of the academy theme, but situations like these made the need for social development starkly evident for the school team. The participants viewed the lack of interest in relationship-building as a barrier to success. Participants believed soft skills were necessary to succeed in the IT profession. Robert, one of the Business Advisory Council members explained that the dynamic, complex, and diverse workplace necessitates professionals who can negotiate social complexities, and those who possess technical and soft skills are more competitive than those who lack the ability to navigate social workspaces.

Yet the nature of IT work, which can often be independent work, may appeal to introverted individuals. Within that context, Linda—an IT executive, shared that although interpersonal skills were necessary, she did not expect all of her IT personnel to be extraverted individuals; there were certainly positions for introverted individuals, particularly in positions such as programmers. Thus, introverted individuals often exhibit certain qualities that can be an asset to an IT firm. Therefore, we believe the discussion about soft skills could be reframed from a deficit view toward a more asset-based perspective.

Nonetheless, the academy recognized its commitment to graduating students who are college- and career-ready and took

steps to develop students' soft skills. In fact, the entire school team (both internal and external stakeholders) wrapped themselves around the concept of soft skill development and infused it in every aspect of the curriculum. For example, seniors were required to develop a capstone portfolio project. Within the capstone project, students completed their cover letters, resumes, letters of recommendation, and artifacts from course projects. They then participated in a mock interview with a business representative who provided them with feedback. This was one of many examples of strategies to develop the soft and employability skills of the students at Cascade.

A square peg in a round hole. The ready acceptance of “geeks” by peers made this school environment unique. According to participants, a student who would be cast as a misfit in a comprehensive high school would find a very different culture in this academy – one of acceptance of individual differences. Along those lines, Melissa, a parent, shared the following about her son:

He was a square peg in a round hole and he just didn't fit in at his regular high school. Loves it here because he's really into the technology part of it; he's into all the gaming and all that kind of stuff.

In referring to her son as a “square peg in a round hole” she was referring to her son's nonconformity to the nature of the comprehensive high school environment. Being able to immerse himself in an IT environment with others who also enjoyed and understood his passion was a positive change for him. There was a sense that there was a shared understanding among students about their uniqueness; this environment empowered students

to be themselves. Claire, another parent, also noted that her son believed the academy promoted a sense of belonging. As such, Cascade was a place that was diverse and appeared to be free of discrimination. This sentiment was also reflected when Carlos, a technology teacher remarked that “this school was a haven for an old geek like me.” Like Claire’s son, Carlos also believed the culture of the academy was one that embraced his uniqueness and accepted him as a “geek”.

A welcoming environment. This culture of acceptance extended beyond acceptance of the general “geek” and included other sub-groups as well. As we toured the campus, we observed males walking down the school hallway holding hands, a transgendered individual hanging out with her friends during lunch, and students with disabilities greeting and engaging other students with confidence. Beth, a core curriculum teacher, commented:

The kids are so nice. We have a lot of autistic students. Sometimes they could get a little weird, but the kids they treat ‘em [sic] just like – if they were in another high school they would be bullied ... Not here. The students are so great with students who are special. They never make fun of ‘em [sic]. I never seen that.

The academy leadership did not tolerate bullying or behavior that isolated individuals. In fact, the school team believed in the importance of developing a learning community that did not tolerate bullying and fostered the social development of students. Yet, what was most interesting was the reaction of students to bullying. In addition to fostering a sense of community,

students treasured and protected their shared safe space by not tolerating behavior that threatened it. Students embraced this positive culture, reinforced it, and challenged those who endangered it.

3.2 ACADEMY ELEMENTS CONTRIBUTING TO A POSITIVE SCHOOL CULTURE

During our interviews, we discovered a few features of the academy model that participants believed were contributors to the unique culture of acceptance at the school.

Open enrollment as an opportunity equalizer. One of the features included the open admissions policy for students entering the academy. While the school required students to apply and go through a lottery system to enter the academy, the requirements did not include prior achievement measures as a factor to gain entry. In fact, this open enrollment policy is a required feature of NAF academies in their quest to serve diverse, urban school student populations. Paul, a retired former superintendent for the school district, explained:

You hit on a point that we debated for many, many sessions. Should there be some sort of screening process for students to enter [Cascade Academy] or the International Baccalaureate program at [Sanders] High? We came down on the side of, ‘no, we’re gonna [sic] let students – we’re gonna [sic] talk about what the expectations are, and let students self-select in. If they meet expectations, wonderful. If they don’t they will select themselves out. Rather than have entrance requirements.’ I think it’s worked very well.

In that regard, Cascade Academy enabled interested students to enter the school without filtering out low achieving students. However, students had to maintain a 2.5 GPA and have minimal behavior issues to stay in the academy. Thus, the open enrollment policy at the school served as a deliberate strategy to level the playing field for underserved students in terms of providing all students with access to a rigorous technology focused curriculum.

While we believed the open enrollment policy seemed to contribute to the equitable and inclusive environment present within the academy, we also found the lottery system laced barriers for ensuring equal access to the academy. Out of the 653 students at the academy, 43% of the students were from diverse ethnic and racial backgrounds and 43% were from low-income families. However, only 32% of the students were female. Given the need to broaden participation in STEM fields (such as Information Technology), we thought it pertinent that measures be taken to ensure a larger pool of female students entering the academy.

A small school as a contributor to community. Another feature of the academy that participants believed influenced the culture of the Cascade Academy was the small size ($n = 653$ students) of the school. Deborah, a former principal of Cascade Academy discussed the small size of the academy as a major benefit to identifying students in need of assistance. During our interviews, she was a principal at another school within the district. Deborah's current school was comprised of 3,200 students. Within that context, she compared the ability for administrators, teachers, and staff members to "touch" each student through targeted instruction at Cascade Academy to that of her

current school. Deborah attested that it was not feasible to have that personal commitment for each struggling student at her larger comprehensive high school. She told us:

To me, [Cascade] is a testimony also to the small school model ... kids are not lost here ... if there is a kid struggling here, we would meet in our good, bad, and ugly, and say, 'This kid's struggling. Do we wanna [sic] – the GPA requirement, he's on the border, or is he gonna [sic] make it?' Invariably somebody would say, 'Let's try to keep him and work with him. I'm gonna [sic] commit to working with him to do this and this and that.'

Deborah explained to us the regular meetings she had with administrators, teachers, and school counselors during the time when she was principal of Cascade Academy. They discussed "the good", "the bad", and "the ugly" to get a sense of student needs and issues, and to make plans for addressing those matters. She spoke of the high level of commitment her team had to ensure everyone succeeded as well as the high academic expectations for the academic success of students. Deborah touted that the school had a 98% graduation rate and administrators, teachers, and school staff members personally knew each student who did not graduate. The team would identify those students and consistently reach out to those who were at-risk of not graduating. Again, she attributed this level of care, commitment, and targeted instruction to the small school model. It was clear to us that the small size of the academy was an ideal environment to ensure all students succeeded through targeted interventions and supports to assist those students who needed help.

Participants also described the unique communal feel of Cascade Academy where every administrator, teacher, school counselor, and staff member as well as individual from the external community are accepted and welcomed when they enter the building. Even more, students (i.e., students from diverse ethnic and racial backgrounds, English as Second Language students, students with disabilities, and LGBTQ students) bullied during middle school or at prior schools had positive experiences at Cascade Academy. The level of interpersonal relationships at Cascade Academy was high. This seemed to be unique to Cascade Academy when comparing to other schools and academies within the district.

It was apparent in both our observations and discussions within the interviews that the small school model contributed to the enhanced interpersonal relationships built with administrators, teachers, school counselors, staff members, individuals from the community, and business and industry as well as post-secondary partners. Not only did the small size influence the communal environment of the school, but also led to enhanced achievement of the students with the targeted instructional approach that emanated from identifying and aggressively working with academically challenged students. It was clear to us that Cascade Academy had high expectations for their students and students met those expectations.

Student shared interest by focusing on information technology. A third key element of the academy model that the participants believed cultivated a culture of acceptance was the academy theme of information technology. Cascade Academy was a wall-to-wall academy in that all students in the school had a focus on and interest in information technology. Within

the overall theme of information technology, students had the opportunity to specialize in computer science, multimedia design, or network systems. Participants described the affinity that students had for Cascade Academy as they self-selected and because they wanted to be there. Sharon, who is both a parent and assistant principal at Cascade Academy, highlighted the reasons her daughter chose to enroll:

It's a school of purpose ... I mean, they have to come in with a purpose to be here ... My daughter chose to come here. Smaller environment, as she was saying. Nerd school. I mean, it was a choice for her to come for those very reasons. I can be focused. I don't wanna [sic] be part of the drama. I don't wanna [sic] be part of it. I wanna [sic] come where, in her terms, where we're business minded.

Participants acknowledged the small school nature, limited athletic programs offered, and the focused nature on information technology as factors affecting students' decisions to enroll in the school. Students attending Cascade Academy did so based on their interests and focus on information technology rather than extracurricular activities or social reasons. Therefore, the self-selection process to participate in the academy promoted a cohesive and positive learning community in the school.

3.3 THE ACADEMY AS A SAFE SPACE

A third theme that resonated from the interviews and informal observations was the safety of the academy. Participants viewed the academy as a safe place for students to be their true authen-

tic selves and support their peers. The school was not only a safe space in terms of breeding a culture of acceptance, it was also literally safe in terms of lacking discipline and concerns for safety. We noticed that when students were walking to and from classes in between class periods, the students were calm and orderly. We were struck by the composure of students, as this is not our typical experience at high schools we have visited. Within that regard, Eric, manager of digital curriculum for the school district, noted:

I don't know if you've looked at their discipline data here, but it's – there's no fighting. I mean, there's like none. The kids are very accepting of one another. There's large groups of ESE and LGBTQ students, it seems like. It's a very diverse student body. It mirrors some of our other high schools in the area. I think the outside perception is that [Cascade] just gets the rich, white, smart kids and that's why they outperform everyone, but nothing could really be further from the truth.

In fact, several participants described the lack of fights between students in the academy. Many believed the lack of fights stemmed from: the ability of students to self-select into the academy, the emphasis on information technology, and the dress code enforced. Students seemed to envision the academy as a real-world business environment and behaved differently within the academy environment compared to outside of the school.

We also believed that the positive and safe learning environment developed as a result of the support, acknowledgement, and pure pride of various internal and external stakeholders. The

internal support system included the administrators, teachers, and staff members within the academy. The external support system included postsecondary partners, business and industry representatives, parents, community members, and mentors. All of these stakeholders invested in the well-being of students and the high level of functioning and reputation build at the school. Participants described the academy as a “gem” of the community and said the community “has their arms wrapped around” the school.

In total, both internal and external stakeholders viewed the academy as an accepting and safe place where students could be themselves. We experienced first-hand the academy as safe through our own observations and walk-throughs of the school. Students were welcoming, well behaved, and professional in class and out of class. Teachers, administrators, and staff members were all committed to the mission of high expectations and success for all students. They all took part in identifying students who were struggling and providing targeted interventions and instruction to ensure all students were academically successful at the school.

4. ANALYSIS AND DISCUSSION

Cascade was an ideal case that demonstrated how a positive school culture developed because of contextual factors related to the academy model. Students benefitted from a unique culture of acceptance that welcomed students characterized as “geeks” and “nerds”. This culture of acceptance became part of the customs, values, and norms of the academy. In other words, students had a shared understanding among their peers about the

value of individual differences and embraced a culture of acceptance that promoted learning. As indicated previously, schools – similar to Cascade – that have positive and supportive cultures of learning do indeed promote caring relationships where students feel valued, welcomed, and a sense of belonging (Sanders, Allen-Jones, & Abel, 2002; Steele, 1992; Waxman, Padron, & Garcia, 2007).

Due to the large number of Cascade students that were introverted, members of the school team were highly committed to working toward the shared goal of soft skill development. This collaboration among adults of the academy was a commonality of high schools with strong school cultures (Louis & Wahlstrom, 2011; Tichnor-Wagner et al., 2016). While we recognized the need and benefits of this collaborative effort toward soft skill development and acknowledged the accepting nature of the academy toward individual differences, we also were cautious about possible unintended consequences of sending negative messages to students regarding the introversion personality trait. We are concerned that should be changed. Instead, we wondered if individuals can exert control over what might be seen as a pre-disposition. Additionally, as we discussed with Linda – an IT executive – introverts can indeed be successful in certain IT positions (i.e., programming). Furthermore, introverted individuals tend to have highly effective qualities for IT firms. These qualities may include working independently for long hours, thinking deeply about all aspects of a situation when making decisions, listening intensely, and the ability to analyze issues. In addition, IT work lends itself to those with an independent work disposition (O*NET, 2006). In fact, according to the Institute for Management Excellence (2006), 25% of the

general population was introverted, while 67% of IT professionals were introverted. Therefore, we suggest that the Cascade school team recognize and provide a counter-narrative to the introvert as a deficit attribute and explain the contribution introverted individuals can make in the IT profession.

Other contextual factors related to the academy model that led to a positive school culture included the open enrollment policy, small size, and wall-to-wall nature of the school. The open enrollment policy of the magnet school enabled a wide range of students to participate in the academy regardless of disabilities, ethnic and racial backgrounds, gender, and socioeconomic status. In fact, the academy enrolled ethnically and racially diverse students at a rate of 43% that is above the national average 32% in the IT sector (US Equal Employment Opportunity Commission, 2016). While students did not need to submit prior academic achievement measures to enter the academy, they did need to maintain a minimum of a 2.50 GPA and minimal behavior issues during their participation in the academy. This inclusive approach to participation was conducive to setting a positive culture within the academy where students were a part of a community of learners that monitored their peers' behaviors and did not accept misbehaviors of their peers – creating a safe environment. Nonetheless, we believe the lottery system that the Cascade school district utilized also contributed to the underrepresentation of females in the IT academy, with only a 32% participation rate compared to a 36% rate in the IT sector (US Equal Employment Opportunity Commission, 2016). As such, the need to broaden participation in STEM related areas has been a lingering challenge nationally (Hernandez-Gantes & Fletcher, 2013). Therefore, we believe it to be critical that mag-

net programs that utilize the lottery system consider weighing factors such as gender more heavily in the decision to admit students into their academics.

Similar to the benefits of the open enrollment policy, the wall-to-wall theme based nature of the magnet program also promoted a cohesive and positive culture of learning. The IT theme attracted students with similar interests and focus. The applied/contextual nature of the IT curriculum helped engage students and focus their studies in a meaningful fashion (Newmann et al., 2007; Newmann & Whelage, 1996). Coupled with the work-based learning opportunities (i.e., job shadowing, paid internships) and business/industry and postsecondary partnerships, students were highly engaged in their academics which should ultimately help them become college and career ready (Hernandez-Gantes & Fletcher, 2013; Fletcher & Cox, 2012; Newmann et al., 2007; Newmann & Whelage, 1996).

5. CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The small size of the academy ($n = 653$), appeared to provide the grounds for a positive school culture and assisted students in experiencing a communal feel where everyone felt accepted and welcomed. The administrators of Cascade Academy attributed the high level of targeted instruction to the small size of the school as well as the 98% graduation rate. In general, the findings aligns with prior research suggesting that a range of 600 to 900 students is an ideal size leading to higher graduation rates, increased sense of personalization and belonging, and lower levels of vandalism (Kuo, 2010; Lee & Smith, 1997; Page et al.,

2002). Given the aforementioned academy structures, the academy was deemed as a safe place lacking fights and bullying. The academy also simulated a business-like environment with investment from both internal and external stakeholders, thereby creating a positive school culture suitable for promoting equity, inclusion, and safety. Such conditions also appear to facilitate the promotion of college and career readiness, which is often found elusive in much larger schools.

To be sure, what we found was a unique school community that may be hard to find elsewhere. As such, we emphasize that the results of this study stemmed from a single case study of a distinguished high school career academy operating under exceptional conditions of community support. Thus, although expected, the results of this case study may not be representative of how career academies operate in general in the US. Further research is needed to characterize how career academies operate under different community conditions (e.g., urban compared to rural settings), occupational context, and size of student population. Additional research on the role of organizational leadership on the promotion of a positive school culture should also represent an important venue for further inquiry.

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