Competence-based education and educational effectiveness

A critical review of the research literature on outcome-oriented policy making in education

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Abstract

The paper assesses the empirical evidence for outcomes of competence-based education which are envisaged by policy-makers, and gives some interpretations of how the topic is handled in the political processes. This is achieved by a review of the research literature as documented in bibliographical databases which cover academic publications and in more practical material. The searches were generic, and included not only specific competence-expressions, but also terms as 'outcomes' and 'learning'. The staggering conclusion of this exercise is that there is hardly any evidence for the effectiveness of competence-based education despite the long period since the 1970s when the approach came up in the US. Whether this is an artefact of the operationalization of the outcomes of competence-based education or not, it seems that there is only very little attention to testing the policy-assumptions that competence-based education is a worthy educational innovation. As this is quite disturbing, it is recommended that more efforts are being made to prove (or falsify) the putative added value of competence-based education initiatives.

Zusammenfassung

Das Papier untersucht die empirische Evidenz zu den Ergebnissen von kompetenz-basierter Bildung oder Erziehung (competence-based education)und interpretiert auch die politische Behandlung dieses Ansatzes. Methodisch wird ein Review der Forschungsliteratur in bibliographischen Datenbasen und auch in praktisch orientierten Materialien auf Basis von Stichwortsuchen (die auch ‚outcomes' und ‚learning' umfassten) und inhaltlichen Auswertungen durchgeführt. Es ergibt sich, dass es kaum Forschung zu den Ergebnissen dieses Ansatzes gibt, obwohl dieser bereits seit den 1970ern in den USA verfochten wird. Paradoxerweise gibt es trotz dem starken politisch vorgebrachten Fokus auf Lernergebnisse in diesem pädagogischen Ansatz kaum eine Überprüfung von Ergebnissen der Praxis auf Basis dieses Ansatzes.

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Introduction

This chapter relates three complex concepts and discourses to each other, first 'competence-based education (CBE)', second 'educational effectiveness (EE)', and third 'education policy making (EPM)'. Superficially this relationship seems quite simple and straightforward, if we take some 'hegemonic discourses' that try to impose certain specified understandings of these concepts. Then it means something like this: competence-based education means to shift attention in education policy making from inputs to outcomes with the purpose to increase educational effectiveness. This chapter looks at the available research evidence that underpins this normative expression.

First the meaning and development of CBE is briefly sketched against the question whether this expression denotes a sufficiently clear specification of a policy that can be implemented and evaluated; this can be brief because this topic is touched upon in previous chapters in this book. The answer is that CBE denotes a quite broad family of policy and practice proposals with diverse and sometimes shifting ingredients (see the chapters in part II on CBE as a global innovation). Moreover, against the scientific ideal of knowledge cumulation, the concept has rather become more diverse and differentiated than focused since the beginnings of the discourse in the US in the 1970s.

Second, a review of the academic and professional literature shows astonishing few attempts to analyse the effectiveness of CBE; it seems that the rhetoric of evidence-based policy and practice has refrained itself from looking at the outcomes of CBE, thus this educational philosophy might represent a kind of magical stick that automatically would bring about the desired results.

Third, at a closer look, education policy making turns out as a very complex field itself, what is clear for political scientists, however, less so for the involved educationalists and several stakeholders in the field, and with policymakers being rather inclined to hide the complexity than to disclose it. To politically 'manage things' they must be simplified so far that they can be handled, therefore a kind of structural heterogeneity arises when policymakers adopt two complex concepts and try to process and implement them. Manifold and diverse meanings must be streamlined by cutting certain trails into the 'messy discourses', thus different languages might arise in the fields of policy making and research.

This paper is based on extensive search and review of literature of two kinds, (i) academic publications from *EBSCOHOST Education Research Complete*, and (ii) mixed user led practical, political and scholarly material from *Google* and *Google Scholar*. The searches were not restricted to 'competence-based education and training', but used also the expressions of 'competency' and 'outcome' instead of competence, and 'learning' instead of education and training. The search results using the different terms provide some overlaps, but display also different bodies of literature; in this chapter CBE is used as a generalised expression, subsuming the different expressions (competence,

competency, outcomes, as well as education, training, learning) in this term.[1] The focus of the searches was on effectiveness, however, besides a good overview about the more basic and general literature has also emerged.

The searches provide some basic patterns of the discourses around CBE. First, the Google search identifies mainly other kinds of documents than the search in the research material, including few popular items from research also, mainly from the 1990s; many practical and political documents and web-items are also available via Google, with slight concentrations in Medicine, the US, and higher education. Second, the different expressions are used in parallel, with different degrees of popularity; e.g., the expressions of outcome and learning are more popular than competence/y and education/training; education is more popular than training, and competence more popular than competency, however, in research 'competency' is. Third, the incidence of publications shows an exponential increase, with a 'take-off' since the 1990s, and a slight increase of tackling with effectiveness or effects from about 10% of hits in the 1970s to about 30% of hits currently. Fourth, four distinct time periods can be identified with stepwise increases of the publication activity: (i) 1970s till 1994; (ii) 1995-2004; (iii) 2005-2010; (iv) 2011-2015. Since the 2000s the representation of 'effect…' shows a kind of cyclical pattern, with sharp increases in 2001, 2005, 2011 followed by some years of decline. Overall about 16% of hits give some emphasis to issues of effectiveness, with an increase to almost 40% in the 2011-14 period. The closer inspection will show many meanings of effectiveness, and only few items that really tackle the effectiveness of CBE.

A control search was also run the other way round, about 'educational effectiveness' in publication titles and the various CBE expressions in text, which indicated basically different discourses about effectiveness and CBE. The inspection of the abstracts gave not even one article that would analyse the effectiveness of CBE in a more general sense.

The complexities of competence-based education

In order to understand the meaning of competence-based education two different aspects are important, first to state positively what is understood by this conception, and second to find alternative and competing conceptions of education and training to CBE.

Morcke, Dornan, Eika (2013, 860) in their historical overview trace CBE (in their terms OBE) back to the 1950s in the US and during a 50 years period find 'two clear cycles of advocacy, then critique', with the second cycle having started more or less on the conceptual fundaments of the first one in the 1980s. Competence-based education was coined as a general concept, based on the ideas of mastery learning and criterion-referencing of assessment. Learning, teaching and organisation should

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1 The listings of results are available from the author.

be guided by clearly specified (minimum) competencies to be demonstrably acquired (for a stylised distinction of CBE and 'traditional' approaches see Tab.1). The conception was devised as a programme for fundamental reform of education. Some current observers draw a distinction between these 'old' approaches, which have to some extent lost interest during the 1980s (embedded in a more general withering down of expectations in policy driven systemic reforms and the rise of economically driven neoliberal programmes of 'high stakes' and 'new public management).

Nevertheless, catchwords of these times sound very familiar today: CBE should 'eradicate the notion of failure', address students as 'focal point' instead of teachers, give students 'as much time as needed to learn' and 'always opportunity to certify', bringing formative assessment to the fore; teacher should 'manage learning' instead of 'dispensing information', and schools should be transformed in to 'learning centres'. Very early some heavy cleavages at theoretical, political, and practical dimensions have emerged, which are prominent in current disputes around CBE. Tyo (1979, p.426) mentions some key issues:

- first, against the strong stance for 'criterion-referencing' in CBE he observes in the practice and policy field a strong 'proclivity toward becoming normed', which has clearly materialised since then;

- secondly, he addresses the top-down bottom-up polarity and positions CBE rather in the top-down pole, with two basic approaches being prevalent, one from top down called 'accountability' that 'purports to stop incompetents from surviving in the system', the other named 'reform' ('In this version, the movement of authority is reversed […] A basic faith in the judgement of the learner is assumed…'; ibid., p.426);

- finally, with reference to Spady (1977) and the 1970s Portland-Project the problems of goal setting and measurement are addressed, with a strong emphasis on the selection of goals and objectives at the local and practical level. '…CBE entails a reconsideration of goals … the mechanisms for reaching the goals must also be re-evaluated … goals originate from the instructors themselves … the movement of goals is from the bottom up instead of from the top down' (ibid, p.425). The problems of assessment should be solved by finding a kind of middle way between 'too mushy' standardised tests and 'too exact' behavioural objectives ignored by the profession.

Table 1:   Conceptual oppositions due to the 'old' CBE-conceptions

CBE approach	'Traditional' approaches
credentials based on 'observable activities demonstrated'	vs. 'seat-time'
assessment by 'criterion-referencing'	vs. 'standardized testing' (national comparison among students)
'balanced curriculum', based on selection of small number of key 'major objectives' (medium level specificity, in between 'mushy' standardised tests and 'too exact' behavioral objectives)	vs. 'segmented behavioral' curriculum
measurement 'explicit', 'mastery of skills' (national-local)	vs. 'slippery' measurement, 'student against student'
flexible time structure, 'as much time as needed to learn', 'always opportunity to certify'	vs. fixed progression time
units, modules	vs. group-based instruction
teacher managing learning	vs. dispensing information
student 'focal point'	vs. teacher at the center
learning centers (+evaluation center)	vs. school
grouping based on mastery of subjects	vs. achievement of other students
testing throughout the course, identifying gaps for decision-making	vs. testing only for certification in the end

Source: Review Tyo 1979, based on Benoist 1975; Harrison & Nagel 1974; Schmeider 1975; Spady 1977a, b; Turney, Hilgendorf & Wright 1974, and others

A 'new' wave of reception of CBE started in the 1990s at the level of the European Union, following first strong moves in the UK. This second wave focuses strongly on the idea of 'Qualification Frameworks (QF)', which specify the desired outputs or outcomes of education and training. One expression are learning outcomes, another are the different variants of competenc(i)es (see chapter 1). Thus the definition of competencies has prominently come to the fore, with different and partly opposing ideas of how the specified outcomes relate to the education, training, and learning processes at the practice level.

In fact the assumed consequences of the definition of competenc(i)es to the practices in the system are ranging from some kind of 'automatic' drivers towards change implied in the formulation of the outcomes at one pole (seminal Bjørnåvold and Coles 2007/2008) through insisting on a high degree of contingency between outcomes and practices (Biemans et al 2004, Mulder, Weigel & Collins 2007) at the other pole, to a denial of direct positive consequences for the practice level (Allais 2010, 2014 coining the expression of NQF as a 'castle in the cyberspace')

The competing theoretical conceptions to CBE seem to have changed between the beginnings, when norm-referencing standardised testing was the main competing approach, and the current discourses, with broader approaches of 'reflective learning' in the field of professional learning being seen as main

alternatives to the outcomes focused CBE (Chow et al 2011; the work by Eraut, and work building on the conceptions by Donald Schön being main sources here). This pattern points to the ambiguities in the approach, as the focus on measurable outcomes due to the standards movement does not contradict norm-referencing standardised testing any more in today's conceptions. Some observers see the main practice of implementation of CBE by simply attaching outcomes for assessment to the ongoing traditional practices, whereas the basic logic is neglected, that 'CBET demands a reverse educational process', in which the objectives should guide the curriculum, teaching, and assessment (Vitali 2011, 237).

We can find different discursive strategies to establish CBE. On one pole CBE is constructed as a 'new promising approach' progressively adopted worldwide, contrasting to 'traditional' ones, giving definitions of the main concepts, and providing recipes of how to implement the approach (see as recent example GIZ 2013). On the other pole authors try to relate the conception to the broader body of established theories and discourses in the scientific field. Mulder, Weigel & Collins (2007) have situated CBE in a broad multidimensional field of meanings of competence that cannot be reduced to a single dimension (Tab.2). Given the diversity of actual and potentially reasonable configurations of the characteristics at the nine dimensions the authors deny the possibility of a reduction of the meaning of competence to a single common and somehow 'right' conception; they plea instead for a pragmatic and contextualised use of the concept, as '[…] it can be concluded that the concept of competence is multidimensional, and specific use of the concept depends on the context of the users' (ibid., p.73). This consequentially would mean for the implementation of CBE that there cannot be a single policy or practice but rather a broader family of policies and practices; furthermore, it would follow for the evaluation of effectiveness that no simple results can be expected from this broad variety of configurations.

Table 2:   Stylised dimensions in a multidimensional field of 'new' meanings of competence

Narrow, decontextualized, functionally performance oriented conceptions	Broad, systemic and situated capability oriented conceptions
Peripheral ability (as competence)	vs. core ability (as core competence)
contextual dissoluteness	vs. situational attachment of competence
orientation of competence towards functions	vs. roles
representation of competence in terms of knowledge	vs. ability
focus of competence on behaviour	vs. capability
person	vs. system as a carrier of competence
scope of competence as specific	vs. general
learnability	vs. unchangeability of competence
performance orientation	vs. development orientation of competence

Source: Mulder, Weigel & Collins 2007

A main observation in the seminal work edited by Burke (1989/2005) was that CBET was widely neglected by the research community around the 2000s , and was taken up mainly as a political and practical endeavour. Kerka (1998), following Jackson (1994) has proposed to see CBET as a policy approach, explicitly contrasting this to 'a teaching-learning process' or 'an educational method'. Ecclestone (1999) describes the discursive strategies and patterns in the UK: that have driven apart the advocates on the one side and the 'critiques' or 'ignorants' on the other, which have created sterile fights instead of searching for evidence (similar, or even more pronounced hostile discourses can also be found in Australia till the 2000s; e.g., Berlach, McNaught 2007).

Practice, research and policy making: 'complexity reduction' and evidence

In the discourses about how research can and should be used in policy and practice Cook and Gorard (2007) have proposed a model of the research cycle that distinguishes different stages and phases including a first descriptive sub-cycle starting with the review of existing evidence, constructing interventions ('artefacts') tried out by feasibility studies, and ending with an elaborate 'prototype' of the policy. In a second causal-analytic sub-cycle the prototypes should be subjected to definitive (ideally experimental) testing, before they are disseminated more widely. Concerning the effectiveness of CBE we can use this conceptualisation for the review of existing research about the different variants of CBE.

An important step in this analysis is to identify the existing policy experience, in particular the shape of the artefacts and prototypes of CBE which are in play, and how they have been handled in policy making. In the discussion of the complexities of CBE we have seen a long tradition of discourses about the basic ideas and conceptions. We can use the literature searches to get a picture of how

policy making appears in the research about CBE. The body for this analysis are the hits in the literature searches that include the expression 'poli…' in their title and/or abstract. Across all searches about 100 items qualify formally, thereof about 20 including expressions of effectiveness and policy making in their title and abstract; the Google searches display only five hits including variations of 'poli…' in the title and displayed text.

Overall a quite differentiated picture arises out of these analyses. First, different policy trajectories clearly come out in the US and Europe. In the US we find the long tradition of CBE since the 1970s that has started as a kind of 'progressive' top down political endeavour, mainly in the public school system. In the meantime however, top-down policies have become discredited, and CBE policy has gradually shifted towards activities in the non-governmental sector, with a quite strong concentration in higher education. Particularly in the Google searches we can find many professional and micro-political networking activities at the level of institutions and supporting foundations and non-profit organisations.[2] US politics towards the school sector has shifted to more traditional patterns of standardisation and high stakes practices combined with economic incentives and new public management strategies, practices which were originally rather antagonised by the CBE movement.

In Europe CBE was first taken up in the 1980s in the English vocational sector, and subsequently adopted by the European institutions, trying to persuade the member states to shift to CBE policies in the overall education system (CEDEFOP 2009). The EU core rhetoric is strikingly similar to the original US arguments against 'traditional' educational methods. Interestingly, the US experience 1970-90 was not systematically assessed before the import of the political rhetoric in Europe or other regions in the world. South Africa, where CBE policies were at first enthusiastically taken up as instruments for reform after the fall of Apartheid, but rather discarded later (Muller 2000; Allais 2014), and Australia as well as Hong Kong (universities: 2005) and Malaysia (schooling: 2008) can be seen somehow as mediating regions. The UK and South Africa have much attention in the research literature.

Another strand of policies and practices, which is equally represented in the literature, compared to issues of general policy making, concerns a set of professional or occupational fields: CBE policy and practice is by far most established in Medicine and health services, mostly under the name of outcome-based education and training (OBET); other strongly discussed and analysed fields in policy

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[2] Examples are the 'Competency-based Education Network', a group of colleges and universities in the US [http://www.cbenetwork.org/competency-based-education/], or 'Educause', an organisation that works in the IT-sector and provides resources for the development and implementation of CBE [http://www.educause.edu/events/breakthrough-models-incubator], or the Council for Adult & Experiential Learning (CAEL) [http://www.cael.org/what-we-do/competency-based-education]; an example of a critical and antagonising organisation/network towards CBE is an organisation called 'Educational Research Associates' that runs webpages and publishing services as 'ERALearning' [http://www.eralearning.com/01/edpolicy.php] or Halcyon House [http://www.halcyon.org/index.html] situated in Oregon.

and practice are IT and Technology/engineering; the research literature is also to some extent concentrated in Social Work, and teaching is a focus in policy/practice as well as in research.

We find emphases on different aspects of CBE in the contributions dealing with education systems or sectors as compared to those about professions or occupations. Whereas the former tend to conceptually discuss and/or explain more basic issues of CBE (what it might mean, who supports or objects it and why, and what the pros and cons of this practices might be), the latter tackle much more technical issues and often provide also empirical studies of some scale.

If we take the above mentioned model of the stages of use of research the found literature clearly concentrates at the first developmental and descriptive cycle of the creation and trying out of CBE as a complex 'artefact'. This can be illustrated by the findings of the review. A closer inspection of the search hits containing expressions of policy making and CBE gives 38 pieces of research literature that clearly and expressively refer to variants of CBE policies or practices (the other pieces include the expressions related to competenc(i)es or outcome randomly in the text).[3] A clustering of this literature gives a meaningful stylised picture (Fig.1):

- 12 items (about one third) are dealing with general reasoning about concepts, theory, and/or overview, those items are distributed in time (overall 1993-2010) and across regions/countries, however, display an interesting time-related pattern by regions, beginning with the US in the early 1990s, followed by the U.K. and South Africa in the late 1990s, and Australia and Africa in the mid-2000s;

- contributions dealing with specific professions or occupations follow to the more general contributions beginning about the millennium, with teaching and medical/health occupations as the main forerunners;

- concentration by topic and countries can be found in the U.K. with teachers (2000-09) and in South Africa with schools (2000-06) during the 2000s (about one fourth each);

- concentration by professions/occupations can be found in medicine/health (one sixth) on a transnational level (mainly U.K., US, Canada, but also Australia, Netherlands, Spain; 2002-10), and less so in social work (2005-14);

- contributions from Asia (Hong Kong, Taiwan) in other occupational fields and higher education follow in the 2010s.

[3] See the documentation at http://www.equi.at/dateien/pol.pdf

Inspecting the content and the main messages given in the contributions concerning the political field we can also find some basic patterns. First, the contributions about concepts, theory, and/or overview are for the most part critically discussing issues of CBE, only one article is clearly and unanimously supportive to the movement (Tchibozo 2010), the others rather explain reasons for the rise of this policy, and often draw the above mentioned distinction between CBE as an policy device and more problematic pedagogical consequences. Very specific conditions appear in the two main countries represented in the literature, with the U.K. lacking an established system of vocational education at the point of developing the N/SVQs, and South Africa being in a total process of transformation and seeking really new approaches for education.

The focus of the contributions in the field of school and teaching lies with the new curricula and standards for teacher education set around 2000 in the U.K. (ref. see Menter, Brisard & Smith 2006), and the changes of education policy towards CBE in South Africa (Muller 2000). Main messages are drawing on instrumentalist limitations of CBE policy and possibilities of broadening the approach towards more reflective and in fact input-oriented approaches.

The contributions in medicine are dealing with general or specific issues of transforming medical education into CBE at the professional level (not at the level of state politics), i.e., the necessity of change and improvement because of changing demands to the health system, and issues of curriculum development, performance assessment, and implementation of the new approach.

A clear result of the inspection of the policy related contributions about CBE and effectiveness is that the reasoning and research concerns firstly the pros and cons of policy changes toward CBE (mainly in the CTO and teaching/schooling related items), and secondly issues of conception and implementation of CBE policy and practice (in the medicine/health related items). Effects are to some degree analysed in terms of the implementation of the concepts of CBE. The main result from these contributions is that implementation is very diverse, with a substantial part of the actors also being reluctant to implement the policy to varying degrees (see Harden 2007 for the practices in medicine, and Struyven & De Meyst 2010).

Figure 1:   Finally selected items containing expressions related to policy making by region/country, topic and time published

Source: Searches in EBSCOHOST Jan 2015 [http://www.equi.at/dateien/pol.pdf]
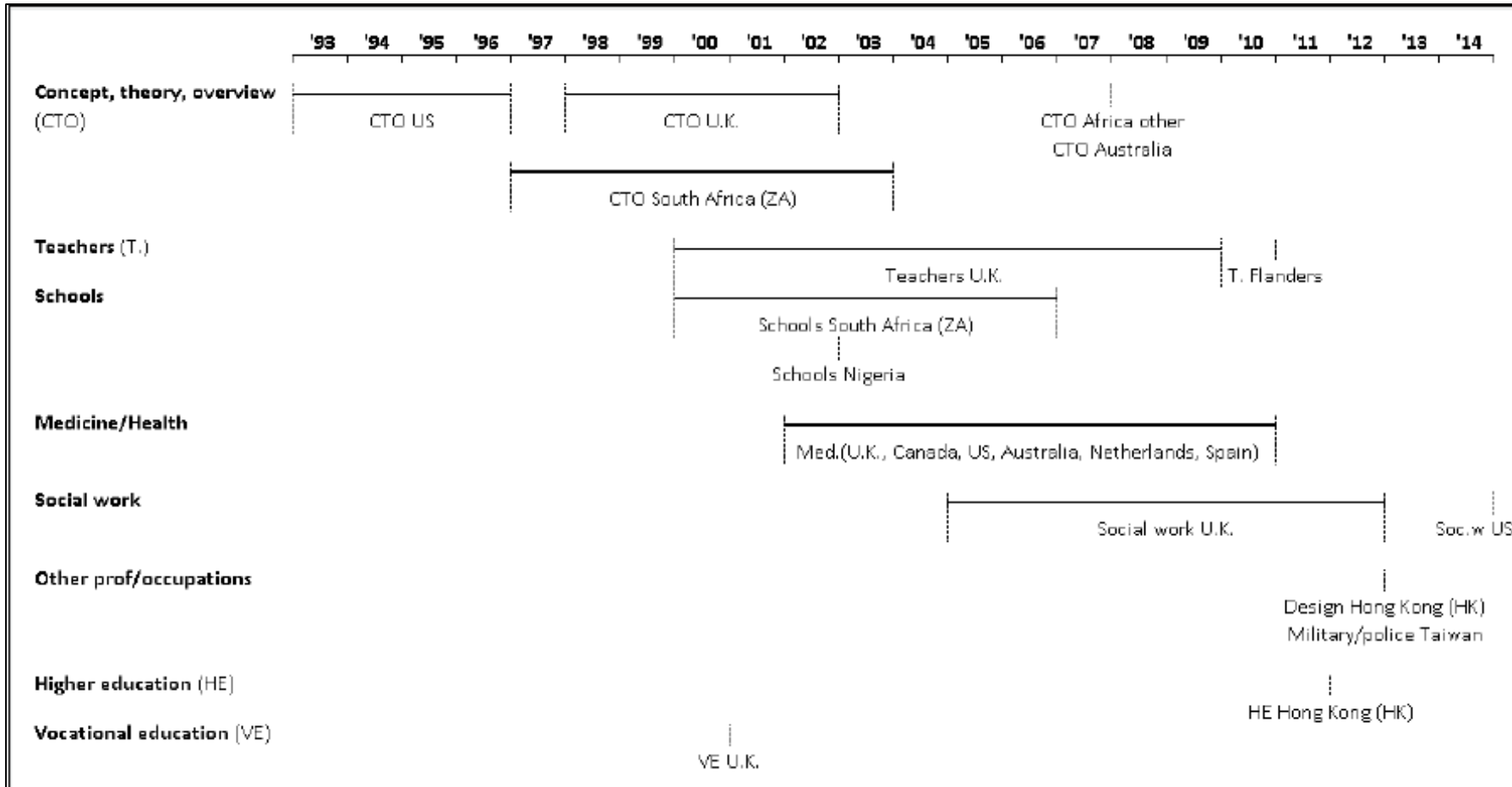
Table 3: Contributions from searches including expressions of policy making and effectiveness

Search	Title, Autors, Source	Methodology, remarks
CBE 2014	The Power of Organizational Readiness to Boost Success With the 2008 EPAS in Social Work Education. By: Nissen, Laura Burney. Journal of Social Work Education. Winter2014, Vol. 50 Issue 1, p5-18.	Literature, conceptual
CBE 2012	When mind, heart, and hands meet: communication design and designers. By: Cheung, Ming. International Journal of Technology & Design Education. Nov2012, Vol. 22 Issue 4, p489-511.	Empirical, 1 course, students feedback by surveys, comments; reflection by staff
CBE 2006	Making Teachers in Britain: Professional knowledge for initial teacher education in England and Scotland. By: Menter, Ian; Brisard, Estelle; Smith, Ian. Educational Philosophy & Theory. Jun2006, Vol. 38 Issue 3, p269-286.	Comparative, document analysis, conceptual
CBE 2005	Approved Social Work Training in Northern Ireland: Using Research to Examine Competence-based Learning and Influence Policy Change. By: Wilson, George; Hamilton, Bernadette; Britton, Frank; Campbell, Jim; Hughes, Phil; Manktelow, Roger. Social Work Education. Oct2005, Vol. 24 Issue 7, p721-736.	Empirical, questionnaire, focus groups, interviews, professionals, users, managers,
CBE 2000	Chapter 6: The Well-tempered Learner. In Muller, Johan (2000) Reclaiming Knowledge. Social Theory, Curriculum and Education Policy. London and New York: Falmer p94-112.	Literature, conceptual
CBT 2012	The Utility of O-T-P Model in Taiwan Coast Guard. Academic Journal By: Chen, Hai-Ming; Hung, Shu-Tzu. Public Personnel Management. Spring2012, Vol. 41 Issue 1, p15-43.	Empirical, survey of training needs public sector, indicators needs
CBT 2009	Preparing for educare: student perspectives on early years training in Northern Ireland. By: McMillan, Dorothy J. International Journal of Early Years Education. Oct2009, Vol. 17 Issue 3, p219-235.	Empirical, interviews, students, compares higher education and vocational education
OBET 2011	Conceptualising quality improvement in higher education: policy, theory and practice for outcomes based learning in Hong Kong. By: Kennedy, Kerry J. Journal of Higher Education Policy & Management. Jun2011, Vol. 33 Issue 3, p205-218.	Literature, conceptual
OBET 2005	Outcomes-based education for a changing health service. Academic Journal By: Morrison, Jill. Medical Education. Jul2005, Vol. 39 Issue 7, p648-649.	Literature, policy statements, conceptual, procedural
OBET 2005	Enhancing learning in South African schools: strategies beyond outcomes-based education. By: Todd, Alexa; Mason, Mark. International Journal of Educational Development. May2005, Vol. 25 Issue 3, p221-235.	Literature, documents, conceptual

Source: Searches in EBSCOHOST Jan 2015 [http://www.equi.at/dateien/pol.pdf]

In total, controlling for double counting, the searches have found 16 items that include both expressions of policy making and effect or effectiveness in their title and abstract; closer inspection shows that 10 of these contributions from the last 15 years (2000-14) really deal with versions of CBE (Tab.3). Very few of the policy related contributions address issues of the results of CBE in terms of learning results or outcomes. Half of the items provide discussions and proposals based on literature reviews; the other half presents empirical results, mostly based on surveys in combination with qualitative data from interviews, focus groups, etc. among students and/or professionals, and obtaining descriptive subjective ratings about needed or desired competencies, methods to acquire them, and in some cases appraisals of education or training programmes. Typically training towards practical skills is favourably rated, and respondents find diverse pitfalls in the courses or measures.

None of the studies allows for a comparison of CBE type learning with other forms of learning. However, this is the key question at the political level if a decision about different educational strategies was to be taken. We can identify two kinds of paradoxes concerning the CBE 'artefacts' at the level of policy and practice:

- The first can be termed as a basic discourse strategy of 'prolonged magical promises', as the rhetorical focus on outcomes and accountability takes the effects of this kind of policy or strategy so much for granted, that an assessment of the outcome of this policy is not envisaged; the prayer of the shift to outcomes lets people forget to ask about the outcomes of practices based on this approach.

- The second paradox concerns the discursive dealing with the tension of the empirical complexity of the CBE artefacts on the one hand, and the attempts towards rhetorical simplicity in the politically driven proposals of the development and implementation of CBE practice on the other; this concerns the creation of a feasible shape of CBE prototypes in order to be practiced against the well-known resistance of many of the practitioners, thus the reductionist practical attempts tend to produce complex and diverse results, which need to be treated with new reductionist attempts in the next round, etc.

The analysis of the literature points to two paths of 'travelling' of the CBE artefact in the course of the last three or more decades, one through different regions and countries, and one from the political and educational system or sector level towards smaller more homogenous professional or occupational fields, and to non-governmental actors in the civil society. The regional travelling might indicate a kind of 'political life-cycle' of the artefact, at least at the level of the formal state and public political system: it was taken up, grew and subsequently declined, and was taken up at other places with a high degree of initial attraction, which develops and declines again, etc. So it has travelled from the US to the U.K., and other regions (Australia, New Zealand, South Africa), and even later to the European Union. As an example for the travelling of CBE Chisholm (2007, abstract) points out that '[…] South Africans have tried to export the idea at the very moment when evidence is revealing little relationship between policy intention and outcome, it is contested at home, and there is a retreat from it in some sectors of education.' While the artefact travelled from the political level to practical endeavours and networks, Europe took up CBE at the political level and has sent it to the member states (similarly, a world-wide travelling is going on despite much critical evidence particularly in regions and countries outside the rich OECD world; Allais 2010). The question arises, why this influential artefact has not provoked more research about its outcomes so far.

The travelling from the political to the professional and occupational level shows different patterns in different fields. In teacher education it is strongly related to the broader discourses of education policy, whereas in medicine and the health services (parts of) the profession have/has taken up the artefact as a part of improvement professional education. In the latter field the discourses are less driven by general arguments of pros and cons than by technical considerations of how competencies might be cooperatively and consensually defined, and how they might subsequently be translated into

curricula, learning and assessment.[4] This forerunning experience might be explained by some specific characteristics of the medical profession, first its well established tradition and autonomy, seconds its strong drive towards evidence-based practice. It might be contended that the construct might be easier applied to a well-established field with a relatively clear structure and marked borders, than in a field which is new and dynamically evolving, without structures and borders of a similar kind.

Educational effectiveness of competence-based education and training

The analysis and discussion of the development at the level of policy making has already given first hints about the gap between the promises and expectations in the increase of effectiveness by CBE on the one hand, and the magic belief into the realisation of these promises on the other. This section will go deeper into this issue by presenting and discussing the results of the literature review.

Before that, we can draw some preliminary conclusions from the above reasoning about the complex concepts and the de facto input-oriented politics of seemingly outcome-oriented CBE. Taking the model of the research cycle presented above, we have seen that explicitly policy related research has mostly not gone further than to construct and discuss the artefact of CBE, and to some extent working on prototypes and analysing their implementation. If we ask why endeavours of definitive testing are not popping up at first sight despite the long period the artefact is already in the world, we can find reasons in the complex nature of the artefact which arise from two different aspects, first the width and diversity of the artefact (a 'holistic' new practice), and second the comprehensiveness of the concept that claims to provide a new education and learning model opposed to the traditional one (i.e. learning centres instead of schools, facilitating instead of teaching, etc.). Definitive testing inevitably presupposes a counterfactual, meaning that results of CBE must be systematically compared to a situation 'without CBE', e.g., teaching and learning along an alternative model or artefact. As long as CBE cannot be clearly demarcated against alternative models, definitive testing is simply not possible.

CBE and effectiveness research. A first result about research-based knowledge of effects of CBE can be found by searching contributions about educational effectiveness (given by title) that include expressions about CBE in different versions. This search found 166 hits;[5] however, the inspection of

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[4] See the material provided by the Association for Medical Education in Europe (AMEE) [http://www.amee.org/home], which has meanwhile a worldwide outreach; e.g. the AMEE Guides No.1-93 or the Best Evidence Medical Education (BEME) Guides No.1-30, several of which are dealing with aspects of CBE.
[5] This search was restricted to the expression of 'educational effectiveness' in titles, because otherwise it would have been meaningless as the words occur too frequently by chance. In the subsequent word search in titles and abstracts of the found items (overall 166) the expression 'competenc…' was only found 3 times in abstracts (never in the title); the expression

the contributions found showed clearly that the effectiveness discourse is disjunctive from the CBE discourses: at closer inspection none of the contributions found did really refer to conceptions of CBE. The expressions included in the searches (competence/y, outcome, education, training, learning) were found very scarcely (competence/y only 3 times totally), or appeared in other, coincidental combinations in the texts.[6]

Most contributions found concern school effectiveness research according to the various models developed in this realm (Reynolds et al 2014; Creemers & Kyriakides 2010, 2013), some further contributions deal with the economic aspects of effectiveness (e.g., Levin 1988, 1998); mostly the school sector is addressed. The main approach of analysing effectiveness is identifying factors and dimensions influencing test results by sophisticated quantitative models, trying to identify patterns of those factors, and their embeddedness in situations or context. These models differ fundamentally from CBE, as they are analytic in the sense that they try to identify patterns of factors, whereas the CBE approaches start with synthetic conceptions of kinds of holistic practices that presuppose already certain patterns of variables (structure of curriculum, facilitating practices by instructors, criterion based assessment, etc.).

Overview about effectiveness in CBE research. To identify a manageable body of literature three additional searches were finally conducted, that have combined versions of CBE and effectiveness.[7] From overall 68 valid contributions found about half (32) were identified that are dealing with issues of effectiveness of different versions of CBE in various areas of education and training; another half include the term 'effect', but deal in fact with other topics (Tab.4). Fig.2 shows a combined time-regional pattern of the contributions, with very few items published before the end of the 1990s, and all early publications being from/about the US; after that we find a time pattern starting with the UK (and South Africa) at the turn of the 1990s to 2000s, followed by Australia during the 2000s, and by the Netherlands after 2010 (only few mostly single publications include other regions/countries, mostly after 2010: Iran, Lithuania, Hungary, Slovenia, Ghana, Taiwan). The occupational/professional groups

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'outcome' was found 56 times in title and/or abstracts, thereof 3 times in titles; the documentation of the search is available from the author.

[6] A closer inspection of the searches 'educational effectiveness' in title and 'competence-based education/training' in text did not find any contributions that clearly refer to CBE approaches; for illustration the items of this search that identified 'competenc…' and/or 'outcome' in abstract and/or title are displayed in table A3.

[7] Specifically three searches were run using the expression 'competence': (A) 'competence-based education/training' in TITLE and 'effective' in TEXT (including ABSTRACT) results documented in table 4a; (B) 'educational effectiveness' in TITLE and 'competence-based education' in TEXT; (C) 'educational effectiveness' in TITLE and 'competence-based training' in TEXT. The 'effectiv…' searches did not find references to CBE (see above); in addition searches were run using 'competency' and 'outcome'. These expressions are more widely used, and searches could be restricted to TITLE and ABSTRACT: (A) 'competency based education/training' TITLE and 'effect' ABSTRACT, (B) 'outcome-based education or training' TITLE and 'effect' ABSTRACT, results documented in table 4b.

reflect more or less the country patterns. So we see here also a traveling of the publication activity through time, as in the policy field.

The items not dealing with effectiveness were distinguished according different aspects of development/delivery of CBE, from the construction/definition of competenc(i)es/outcomes, through implementation to assessment, including also a category of general items dealing with issues of concepts/theory/overview (CTO) of CBE. Here we cannot find any logical structure (which could make sense, e.g., starting with the definition, going to implementation, and finally to assessment). These contributions concentrate a bit later in time than the effectiveness contributions, and there is some concentration on assessment in the 2000s, and most contributions deal with CTO from mid-2000s to mid-2010s. This structure would indicate rather a recent revival of basic discussions about CBE than kinds of systematic collective development and knowledge production.

Table 4:   Overview of searches about effectiveness

	'competence'	'competency'	'outcome'	TOTAL
Total items CBE and effect	56	15	27	98
-dealing with CBE effectiveness	15	10	8	33*
-dealing with CBE not effectiveness	29	2	-	31
-[reviews; not considered]	3	1	-	4
Valid contributions dealing with CBE	47	13	8	68
-not dealing with CBE	9	2	19	30

* Three contributions were found more than once in different searches, so the 'net' number of contributions dealing with effectiveness is 30 contributions
Source: Searches in EBSCOHOST Jan 2015 [http://www.equi.at/dateien/cbe.pdf]; Searches in EBSCOHOST Jan 2015 [http://www.equi.at/dateien/cybet-obet.pdf]

Figure 2:   Finally selected items containing expressions related to effect by region/country, topic and time published

Source: Searches in EBSCOHOST Jan 2015 [http://www.equi.at/dateien/cbe.pdf]; Searches in EBSCOHOST Jan 2015 [http://www.equi.at/dateien/cybet-obet.pdf]
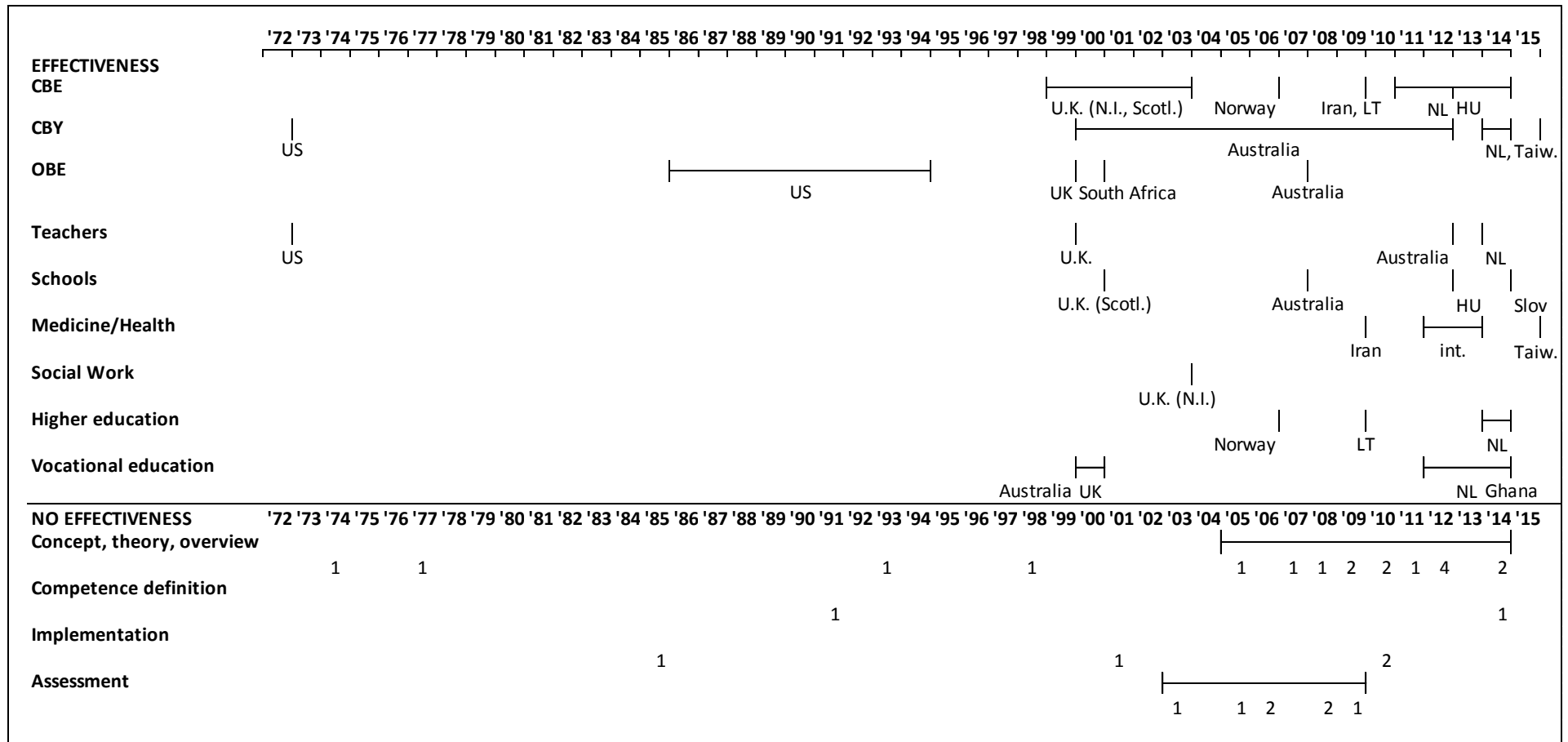
Conceptions of effectiveness. The contributions include many different aspects and versions of effectiveness, and mostly there is not much conceptual clarification of what effectiveness might mean. As an exception the contributions in the field of health/medicine make use of the modified Kirkpatrick Model of educational outcomes distinguishing six levels of outcomes. The Kirkpatrick Model was developed in the 1950s and is a categorization of levels of training outcomes which was and still is quite popular in the private training sector. This classification seems useful for providing an overview about the aspects of effectiveness covered by the selected contributions. We see a quite even distribution of contributions that analyse, mostly empirically, the reactions of students on CBE practices (level 1) through the analysis of effects on the development of learning knowledge, skills, or attitudes (level 2), and less so on behaviours (level 3) to more broad an mostly narrative analyses of effects on schools, teachers and/or broader systems (level 4); very few empirical analyses are dealing with this level.

Figure 3:   Model of educational outcomes, by Kirkpatrick, Freeth et al, and Steinert et al.

			Proportion of identified contributions*
Level 1	REACTION	Participants' views on the learning experience, its organization, presentation, content, teaching methods, and quality of instruction	9 (30%)
Level 2A	LEARNING change in attitudes	Changes in the attitudes or perceptions among participant groups towards teaching and learning	6 (20%)
Level 2B	LEARNING modification of knowledge or skills	For knowledge, this relates to the acquisition of concepts, procedures and principles; for skills, this relates to the acquisition of thinking/problem-solving, psychomotor and social skills	8 (27%)
Level 3	BEHAVIOR change in behaviors	Documents the transfer of learning to the workplace or willingness of learners to apply new knowledge & skills	6 (20%)
Level 4A	RESULTS change in the system / organizational practice	Refers to wider changes in the organization, attributable to the educational program	8 (27%)
Level 4B	RESULTS Change among the participants' students, residents or colleagues	Refers to improvement in student or resident learning/performance as a direct result of the educational intervention	8 (27%)

* From the 'net' number of 30 contributions some were ordered to more than one level (average 1.4 ratings per contribution), and few could not be ordered to a level because of their more general or multiple argument; most of the more general contributions were rated in the level 4 categories.

Source: Steinert et al 2006, based on Freeth et al 2003 and Kirkpatrick Partners [http://www.kirkpatrickpartners.com/OurPhilosophy/TheKirkpatrickModel/tabid/302/Default.aspx]

Methodology and scale of the contributions. Almost all contributions include some kind of empirical data gathering and analysis, mostly of quantitative methodology, a few refer to case studies or literature based reasoning. We can identify three broad types of methodological designs using empirical data (1) experimental or quasi-experimental designs that compare in a controlled way some kind of CBE with different approaches, mostly 'traditional' education or training (6 studies); (2) more elaborate empirical designs that analyse certain factors within versions or models of CBE (11 studies);

(3) studies that employ surveys or other data in a mainly descriptive way to show or explain some aspects of CBE (6 studies). The remaining studies include some narrative literature based contributions that point out certain problems of CBE (5 studies) and systematic reviews (2 studies). What can we learn about effectiveness of CBE from these different kinds of studies? (see Tables A5ab for information on the studies)

The studies of type (1) using controlled comparisons of CBE practices are dealing with a broad range of contexts and competencies, three schools-related (elementary schools in Slovenia 2014, prevocational school in The Netherlands 2011, and teacher preparation in the US 1972), and the remaining three in the fields of nursing education (Taiwan 2015), continuing education for general practitioners (Iran 2009), and consultants with teachers and parents (US 2004). These studies are mostly small scale (concern one or few courses at one school or university) and specific in content and they by their majority give quite clear results in favour of CBE. The adverse result stems from a bigger study in the Netherlands, where the extent of CBE was varied in a quite abstract manner, and where students developed more knowledge in learning situations with fewer characteristics of CBE.

The studies of type (2) do not allow conclusions about the effectiveness of CBE compared to other approaches but can elaborate on the understanding of how CBE might work, which factors are important, how it can be assessed, and the like. A majority of these studies is originating in the Netherlands. A recent hot topic concerns the construction of instruments for self-assessment and the relationship of self-efficacy and earned credits, with ambiguous results; two contributions concern the self-perceived effects of CBE by polytechnic students in Ghana. A long-term case study analyses the broader political and sociological effects of the CBE reform in Australia from the 1990s in terms of the Foucaldian concepts of disciplinarity and governmentality (Hodge & Harris 2012). First, they show how the parameters of a vocational CBE programme have changed from being voluntarily piloted in the 1980s to becoming a part of the nation-wide CBE reform in the 1990s. The actors were subsumed under a disciplinary regime by shifting the responsibility for the definition of competencies from the institution to the employers and by setting tighter market regulations upon the financing of the institution. The authors cite their disappointed interviewees by saying 'I don't call Compentency Standards standards any more. You could drive a truck through the damned things', and 'It's all about funding; they don't care about anything else' (Hodge & Harris 2012, 160). Second, the CBE reform is shown as a vehicle to change the whole economic policy discourse in Australia into the neoliberal direction towards workers being responsible for training and employment in order to increase competitiveness.

Three older contributions in this group analyse effects of CBE in a US city, bringing about an increase of average test results in different subjects (1985), perceptions of CBE in relation to reflexivity among teacher students in a UK college (1999), and effects of CBE in higher level vocational education in Scotland in terms of student experience and perception (2000). The analysis about effects of Scottish

higher level qualifications includes a broader review of existing studies and the analysis of an extensive data sample about students indicates positive results of CBE for participants, however, a very low uptake, and thus a very small contribution to the development of human capital.

The studies of type (3) include a wide range of topics that mostly do not answer questions of effectiveness of CBE. Students, parents and teachers of a public school at primary and secondary level in Hungary (2012) was surveyed to find out their opinions about a set of curricular initiatives towards CBE, with mostly positive responses about acceptance. Students in Informatics and Mathematics at Vilnius University (2009) expressed positive appraisals about European concepts towards CBE and quite negative views about the academic staff of the university. The analysis of access data of Norwegian higher education institutes and staff interviews (2006) indicated that the initiative to open access by the accreditation of prior learning (*realkompetanse*) has contributed to accessibility, however, somehow in an uneven manner towards institutions in more remote regions with lower supply of candidates. A bigger study about the impact of CBE in social work in Northern Ireland (2005) compared the opinions of workers trained before and after the reform, with quite positive results in favour for post CBE training. The biggest studies report about the development of 10 years CBE in Australian vocational education (Smith 1999a,b). Firstly they have analysed the process of implementation of CBE by developing an indicator based on 14 features, showing a much more slow pace than expected; secondly effects on teaching and learning, providers, curriculum developers, teachers and trainers, students and trainees, staff development, and policymakers. Concerning effects on competenc(i)es the author reaches an ambiguous conclusion, saying that 'the system has evolved over the ten years of its implementation to one which is workable, although there is some doubt about whether it is actually improving student and trainee outcomes and thereby helping to create a more skilled Australian workforce'(Smith 1999b, 115). Thirdly, the effects on teachers have been analysed showing that their role has only changed to some degree 'from transmission to transaction' (Smith 1999a, 71), as far as self-paced learning has evolved, and ownership of knowledge was made more common among actors.

Review. From the remaining contributions Morcke, Dornan & Eika (2013) provide a historical review of effects of CBE in general and a systematic review of current empirical work about undergraduate medical education. From a search base of about 2.000 articles they identified only 8 that fulfilled their criteria for review. Their findings are very few about teachers, showing on the one hand that learning outcomes might influence course planning and teaching, and on the other that more experienced teachers might be limited by a focus on outcomes (ibid., 860). Concerning student learning some promotion of active learning, better preparation of teaching sessions, higher scores on tests, and with more caveats, more self-evaluated competence and confidence was found. A negative finding is reported, that only one third of students used the course objectives, and moreover, those had lower test-scores. The authors conclude that 'OBE has been advocated and implemented in undergraduate medical education, but this has not been followed by substantial research on the impact of learning

outcomes on teaching and learning medicine' (ibid., 860), and finally: 'We know little about what OBE is good for; what the connections are between learning outcomes and teaching; when outcomes are helpful for teachers and when not; when and how they are useful for self-directed learning.'(ibid., 862).

Conclusion

Overall, we see in these results the wide room opened up by CBE, and the diversity of its application, as well as the diversity of trying to analyse it. Much heated ideological debates and heavy critiques can be found, whereas the empirical results are basically lacking. By and large scholars are quite in favour of the analysed versions of CBE, and in their observed aspects. The analyses have also found different kinds of approaches towards CBE, some that see and implement it as a broad systemic political solution (as, e.g., in Australia or the U.K. for some time), and echoed by the EU currently, and others that follow it rather at a smaller scale and concrete level of an occupation or a profession (as, e.g., in fields of medicine or health professions). The latter more concrete approach seems the more promising one that also avoids the big ideological fights.

The review undertaken in this chapter must be seen as an explorative one, which has tried to find a kind of big picture. It can be finished with a plea for following-up on this path of review, going deeper into the different aspects, widening the searches, and improving the ratings of the material.

Concerning the relationship of policy making and research, the author has learned from this undertaking once more, that the idea of 'evidence-based policy' is not capable of bearing the practice of policymakers because they ever will follow their own ideas of trying to make things in new ways, and thus will ever be ahead of research and evaluation. And even if the big promises cannot be fulfilled, the results do also not indicate that the attempts have been clearly harmful to someone.

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Annex tables/figures

Annex-Table 1:   **EBSCOHOST searches**

| SEARCH EBSCOHOST Education Research Complete (end January 2015)		Average hits per year		
	hits 1976-2014	1976-2014	1991-2010	2011-2014
(1) cbe: 'competence-based education' & 'effectiveness' & 'review' (all text)	210	5,4	6,9	18,0
thereof word search '*effect…*' in titles and abstracts	58	1,5	1,8	5,5
(2) cbt: 'competence-based training' & 'effectiveness' & 'review' (all text)	150	3,8	5,7	9,0
thereof word search '*effect…*' in titles and abstracts	32	0,8	1,1	2,8
(3) obet: 'outcome-based education' or 'otcome based training' (title)	128	3,3	5,0	6,3
thereof word search '*effect…*' in titles and abstracts	35	0,9	1,1	3,0
(4) cobl: 'competence' or 'competency' or 'outcome-based learning (title)	164	4,2	4,0	19,8
thereof word search '*effect…*' in titles and abstracts	59	1,5	1,3	8,5
(1) – (4) Search hits total, gross* all expressions	652	16,7	21,5	53,0
thereof word search '*effect…*' in titles and abstracts	184	4,7	5,2	19,8
Proportion of hits that include 'effect…' in title and abstract / all hits				
% 'effect…' in hits (1) cbe	13%	13%	20%	32%
% 'effect…' in hits (2) cbt	11%	11%	15%	27%
% 'effect…' in hits (3) obet	21%	21%	22%	47%
% 'effect…' in hits (4) cobl	15%	15%	20%	42%
% 'effect…' in hits total	16%	16%	20%	37%

* not controlled for double counting of articles in the different searches

Annex-Table 2: **Google Searches**

SEARCH Google and Google Scholar (end January 2015)

	Overall Search		Scholar search	
Competence-based education and training:	~95.2 Mio. hits	100%	1.580.000 hits	100%
Competency based education and training:	~4.2 Mio. hits	4%	416.000 hits	26%
Outcome-based education and training:	~ 30.7 Mio. hits	32%	3.440.000 hits	218%
Competence-based learning:	~167.0 Mio. hits	175%	1.920.000 hits	122%
Competency based learning:	~ 4.8 Mio. hits	5%	442.000	28%

Annex-Figure 1: **Google searches, overview about distribution of topics and regions of top 20 ranked hits**
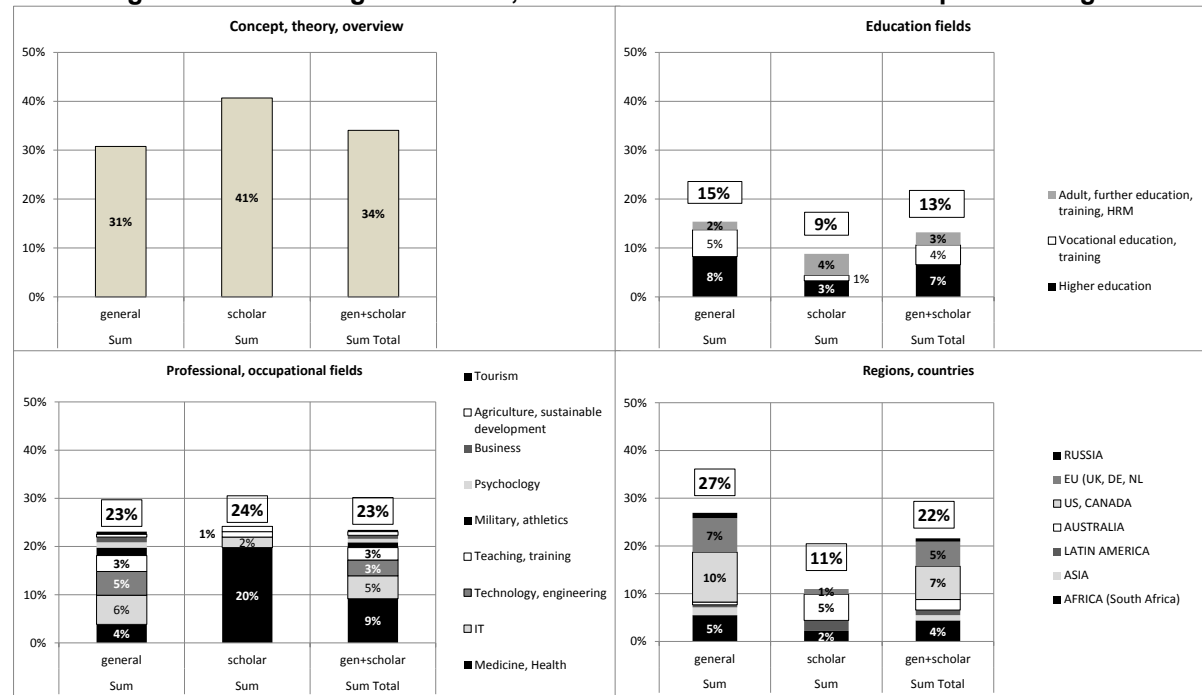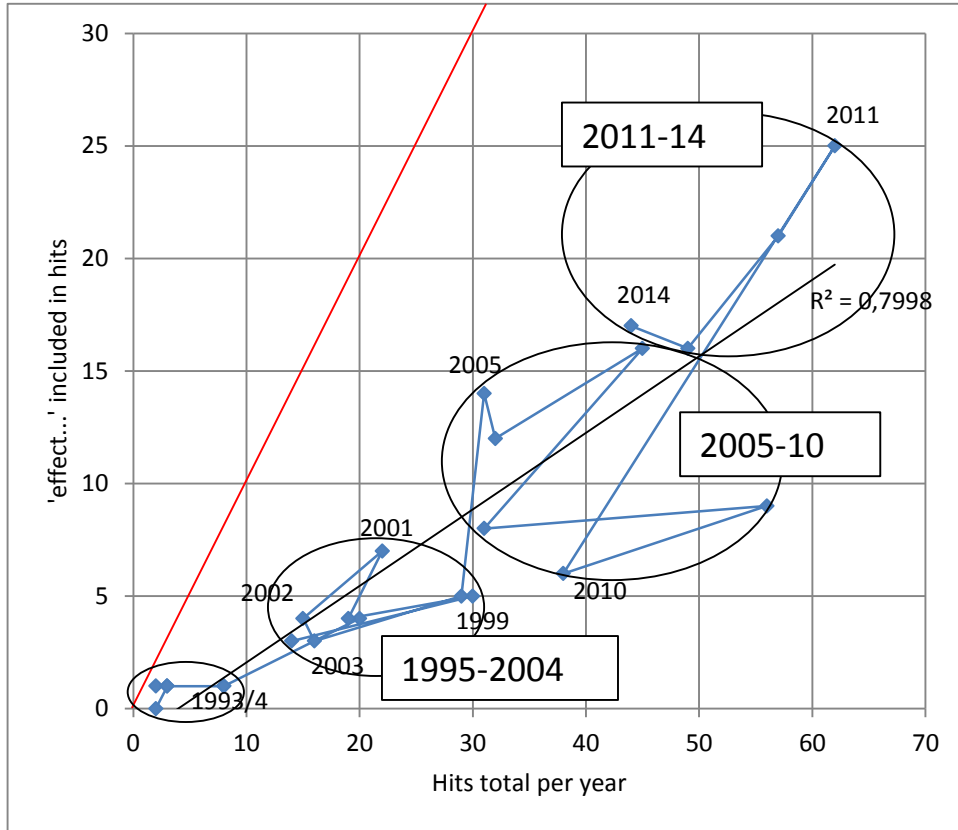
Annex-Figure 2: **Google searches, overview about topics and regions of top 20 ranked hits, absolute numbers**
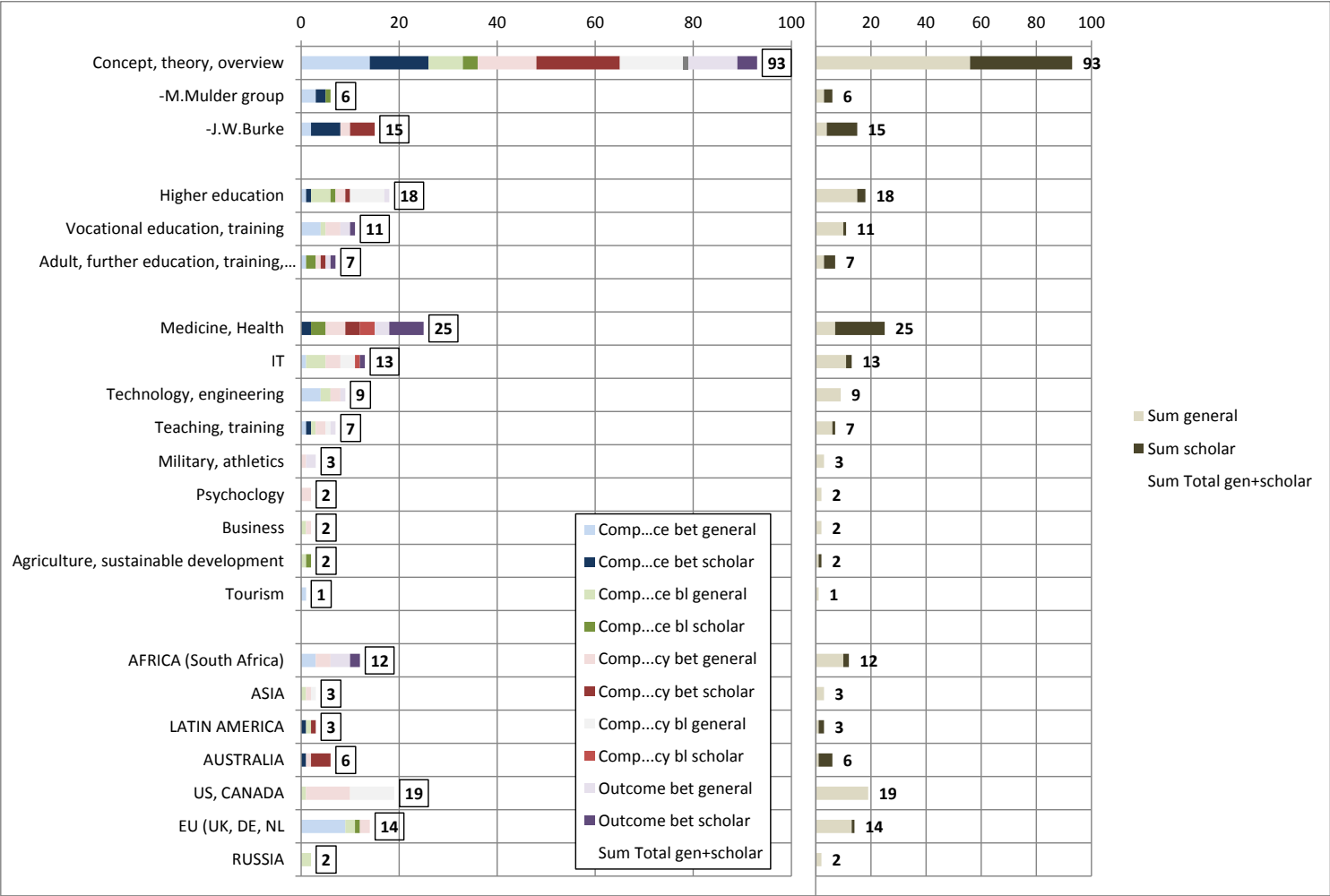
Annex-Figure 3: **Total number of hits in search EBSCOHOST 1976-2014, proportion of 'effect…' in titles and abstracts**
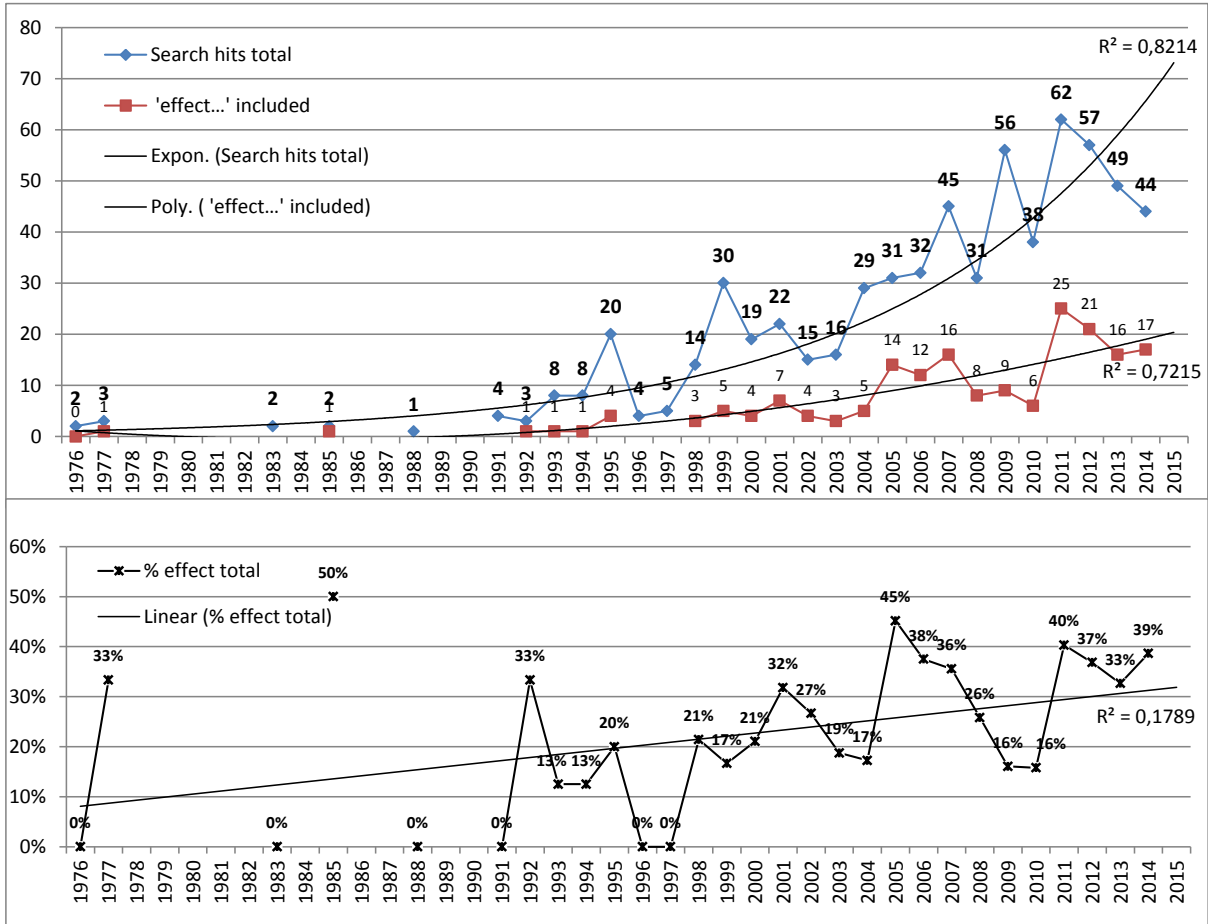
Annex-Figure 4: **Time related pattern of search hits total and 'effective…'
included**

Annex-Table 3: **Incidence of 'poli…' in EBSCOHOST searches**

	Search (1) cbe (text, title)	Search (2) cbt (text, title)	Search (3) effect/iveness (title, abstract)	Search (4) obet (title, abstract)	Searches (1) to (4)
ABSOLUTE COUNTS					
Total 'gross' hits*	260	159	166	182	767
'poli…' hits	99	65	55	61	280
'poli…' items (articles etc.)**	44	23	28	30	125
thereof control double count	33	16	28	19	96
'poli…' title	7	6	7	5	25
'poli…' & 'effect…'	8	5	7***	10	30
thereof control double count	8	3	7	5	23
PERCENTAGE					
Total 'gross' hits*	100%	100%	100%	100%	100%
% 'poli…' hits	38%	41%	33%	34%	37%
% 'poli…' items	17%	14%	17%	16%	16%
thereof control double count	13%	10%	17%	10%	13%
% 'poli…' title	3%	4%	4%	3%	3%
% 'poli…' & 'effect…'	3%	3%	4%	5%	4%
thereof control double count	3%	2%	4%	3%	3%

* not controlled for double counting; different searches/combinations counted as extra cases (therefore Numbers slightly higher than in Table A1)
** one item (article, book, review, etc.) can display more than one hit (average 2.24 hits/item)
*** combined 'effect…' with 'competenc…' and/or 'outcome'

Annex-Table 4:   Contributions from searches starting with educational effectiveness, combined with competence/y or outcome

Year	Title, Autors, Source
	Search 'effectiv…
2014	Effects of a Live Educational Music Therapy Intervention on Acute Psychiatric Inpatients' Perceived Social Support and Trust in the Therapist: A Four-Group Randomized Effectiveness Study. By: Silverman, Michael J. Journal of Music Therapy. Fall2014, Vol. 51 Issue 3, p228-249
2013	Dental Student Perceptions of Case-Based Educational Effectiveness. By: McKenzie, Carly T. Journal of Dental Education. Jun2013, Vol. 77 Issue 6, p688-694.
	Search 'outcome'
2010	School Factors Explaining Achievement on Cognitive and Affective **Outcomes**: Establishing a Dynamic Model of Educational Effectiveness. By: Creemers, Bert; Kyriakides, Leonidas. Scandinavian Journal of Educational Research. Jun2010, Vol. 54 Issue 3, p263-294.
2014	Effects of a Live Educational Music Therapy Intervention on Acute Psychiatric Inpatients' Perceived Social Support and Trust in the Therapist: A Four-Group Randomized Effectiveness Study. By: Silverman, Michael J. Journal of Music Therapy. Fall2014, Vol. 51 Issue 3, p228-249.
2013	Using the Dynamic Model of Educational Effectiveness to Identify Stages of Effective Teaching: An Introduction to the Special Issue. By: Creemers, Bert P. M.; Kyriakides, Leonidas. Journal of Classroom Interaction. 2013, Vol. 48 Issue 2, p4-10.
2012	A Study of the Effectiveness of Supplemental Educational Services for Title I Students in Baltimore City Public Schools. By: Harding, Heather R.; Harrison-Jones, Lois; Rebach, Howard M. Journal of Negro Education. Winter2012, Vol. 81 Issue 1, p52-66.
2007	The Birth to School Study: evidence on the effectiveness of PEEP, an early intervention for children at risk of educational under-achievement. By: Evangelou, Maria; Brooks, Greg; Smith, Sally. Oxford Review of Education. Nov2007, Vol. 33 Issue 5, p581-609.
2007	Educational psychology and the effectiveness of inclusive education/mainstreaming. By: Lindsay, Geoff. British Journal of Educational Psychology. Mar2007, Vol. 77 Issue 1, p1-24.
2004	The impact of multifaceted educational structuring on learning effectiveness in a surgical clerkship. By: Van Der Hem-Stokroos, H. H.; Daelmans, H. E. M.; Van Der Vleuten, C. P.; Haarman, H. J. Th.; Scherpbier, A. J. J. A. Medical Education. Aug2004, Vol. 38 Issue 8, p879-886.

Source: Searches in EBSCOHOST Jan 2015 [searches B, C in http://www.equi.at/dateien/cbe.pdf]

Annex-Table 5:   Contributions from searches starting with expressions of CBET and including effectiveness:
(a) Competence-based education/training [8]

Year	Title, Autors, Source	Methodology, remarks
	'effect…' FOUND IN TITLE/ABSTRACT and corrected by inspection	
2014	Exploring the Validity and Robustness of a Competency Self-Report Instrument for Vocational and Higher Competence-Based Education. By: Khaled, Anne E.; Gulikers, Judith T. M.; Tobi, Hilde; Biemans, Harm J.A.; Oonk, Carla; Mulder, Martin. Journal of Psychoeducational Assessment. Aug2014, Vol. 32 Issue 5, p429-440.	Netherlands, empirical and conceptual, integrating theory and practice, pilot-study in VET and HE, 351 students, difference concrete/abstract competencies (type ii)
2014	Student perceptions of assessment and student self-efficacy in competence-based education. By: van Dinther, Mart; Dochy, Filip; Segers, Mien; Braeken, Johan. Educational Studies. Jul2014, Vol. 40 Issue 3, p330-351.	Empirical, studies relations between assessment characteristics, self-efficacy and outcomes (type ii)
2012	ADAPTATION ANALYSIS OF SOME ALTERNATIVE COMPETENCE-BASED EDUCATION PROGRAMS' IN A HUNGARIAN PUBLIC SCHOOL. By: Hanák, Zsuzsanna; Dorner, László. Problems of Education in the 21st Century. 2012, Vol. 39, p52-61.	Conceptual and empirical, small study (1 school, 158 participants) survey about perceptions of CBE characteristics (type iii)
2009	[DOUBLE across] Does an outcome-based approach to continuing medical education improve physicians' competencies in rational prescribing? By: Esmaily, Hamideh M.; Savage, Carl; Vahidi, Rezagoli; Amini, Abolghasem; Dastgiri, Saeed; Hult, Hakan; Dahlgren, Lars Owe; Wahlstrom, Rolf. Medical Teacher. Nov2009, Vol. 31 Issue 11, pe500-e506.	Iran, empirical, specific occupation, studies effects of CBE on certain behaviour of general practitioners, survey 112 participants (type i)
2003	Approved Social Work Training in Northern Ireland: Using Research to Examine Competence-based Learning and Influence Policy Change. By: Wilson, George; Hamilton, Bernadette; Britton, Frank; Campbell, Jim; Hughes, Phil; Manktelow, Roger. Social Work Education. Oct2005, Vol. 24 Issue 7, p721-736.	Review of effectiveness of CBE, specific occupation, based on literature, no clear result (type iii)
1999	Where's the Competence in Competence-based Education and Training? By: Lum, Gerard. Journal of Philosophy of Education. Nov99, Vol. 33 Issue 3, p403.	Conceptual discussion of CBE, critical to approach
	Effectiveness as topic found by INSPECTION OF ABSTRACT	
2014	DEVELOPMENT AND EVALUATION OF A COMPETENCE-BASED TEACHING PROCESS FOR SCIENCE AND TECHNOLOGY EDUCATION. By: Pešaković, Dragica; Flogie, Andrej; Aberšek, Boris. Journal of Baltic Science Education. 2014, Vol. 13 Issue 5, p740-755	Slovenia, instruments for measurement, case of elementary education (type i)
2013	The relationship between perceived competence and earned credits in competence-based higher education. By: Kamphorst, J.C.; Hofman, W.H.A.; Jansen, E.P.W.A.; Terlouw, C. Assessment & Evaluation in Higher Education. Sep2013, Vol. 38 Issue 6, p646-661.	Netherlands, empirical, higher education, explaining perceived competence and earned credits by learning process factors (type ii)
2013	The construct validity and predictive validity of a self-efficacy measure for student teachers in competence-based education. By: van Dinther, Mart; Dochy, Filip; Segers, Mien; Braeken, Johan. Studies in Educational Evaluation. Sep2013, Vol. 39 Issue 3, p169-179.	Empirical, teacher education, analysing factors influencing self-efficacy in a competence framework (type ii)
2012	A critical time for medical education: the perils of competence-based reform of the curriculum. By: Malone, Karen; Supri, Salinder. Advances in Health Sciences Education. May2012, Vol. 17 Issue 2, p241-246.	International, medical education, review, lessons from history of CBE
2011	Development of student knowledge in competence-based pre-vocational secondary education. By: Koopman, Maaike; Teune, Peter; Beijaard, Douwe. Learning Environments Research. 2011, Vol. 14 Issue 3, p205-227.	Netherlands, empirical, pre-vocational schools, teacher questionnaire, student

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[8] Two contributions were excluded here because they do not refer to versions of CBE: Marketing to increase participation in a Web-based continuing medical education cultural competence curriculum. By: Estrada, Carlos A.; Krishnamoorthy, Periyakaruppan; Smith, Ann; Staton, Lisa; Korf, Michele J.; Allison, Jeroan J.; Houston, Thomas K. Journal of Continuing Education in the Health Professions. Winter2011, Vol. 31 Issue 1, p21-27; and [Active interprofessional education in a patient based setting increases perceived collaborative and professional competence. By: Hallin, Karin; Kiessling, Anna; Waldner, Annika; Henriksson, Peter. Medical Teacher. Feb2009, Vol. 31 Issue 2, p151-157.]; three contributions not dealing with effectiveness were excluded from those found in title/abstract; further three contributions found were books reviews (two books), which were also excluded from the analysis.

Year	Title, Autors, Source	Methodology, remarks
		knowledge depending on extent of CBE (type i)
2009	TRANSFORMATION OF UNIVERSITY: TOWARDS PRAGMATISM AND COMPETENCE-BASED EDUCATION. UNIVERSITETŲ KAITA: PRAGMATIZMO IR KOMPETENCIJŲ UGDYMO LINK. By: Bulajeva, Tatjana; Duoblienė, Lilija; Targamadzė, Vilija. Pedagogy Studies / Pedagogika. 2009, Issue 93, p9-16.	Lithuania, empirical, higher education IT, students, two master programmes, competencies, idea of university and CBE (type iii)
2000	The rhetoric and reality of professional competence-based vocational education in Scotland. By: Canning, Roy. Research Papers in Education. Mar2000, Vol. 15 Issue 1, p69-93.	UK, Scotland, empirical, level 4-5 professional awards, 236 students, survey experience (type ii)
1999	Relationship between competence-based education and student reflection on practice: a UK case study of initial teacher training. By: Burchell, Helen; Westmoreland, Susan. International Journal of Training & Development. Jun99, Vol. 3 Issue 2, p156.	UK, empirical, teacher education, case study, one HE programme (type ii)

Source: Searches in EBSCOHOST Jan 2015 [search A in http://www.equi.at/dateien/cbe.pdf]

(b) Competency/outcome-based education/training

Year	Title, Autors, Source	Methodology, remarks

A. search TITLE 'competency based education/training, 'effect…' FOUND IN ABSTRACT

Year	Title, Autors, Source	Methodology, remarks
2015	Performance evaluation of nursing students following competency-based education. By: Fan, Jun-Yu; Wang, Yu Hsin; Chao, Li Fen; Jane, Sui-Whi; Hsu, Li-Ling. Nurse Education Today. Jan2015, Vol. 35 Issue 1, p97-103.	Taiwan, empirical, nursing, quasi-experimental CBE vs. traditional, 4 scales (312 undergraduates) (type i)
2014	Assessment criteria for competency-based education: a study in nursing education. By: Fastré, Greet; Klink, Marcel; Amsing-Smit, Pauline; Merriënboer, Jeroen. Instructional Science. Nov2014, Vol. 42 Issue 6, p971-994.	Netherlands-Belgium, empirical, nursing, secondary VET, CB vs. performance based assessment criteria on outcomes (type ii)
2014	Perceived effects of competency-based training on the acquisition of professional skills. By: Boahin, Peter; Hofman, W.H. Adriaan. International Journal of Educational Development. May2014, Vol. 36, p81-89.	Ghana, empirical polytechnic, students perceptions perceptions (316 students, randomly, stratified selected) (type ii)
2013	A disciplinary perspective of competency-based training on the acquisition of employability skills. By: Boahin, Peter; Hofman, Adriaan. Journal of Vocational Education & Training. Sep2013, Vol. 65 Issue 3, p385-401.	
2013	[DOUBLE] Outcome (competency) based education: an exploration of its origins, theoretical basis, and empirical evidence. By: Morcke, Anne; Dornan, Tim; Eika, Berit. Advances in Health Sciences Education. Oct2013, Vol. 18 Issue 4, p851-863.	Medical education, systematic review of effects 1999-2010
2012	Discipline, governmentality and 25 years of competency-based training. By: HODGE, STEVEN; HARRIS, ROGER. Studies in the Education of Adults. Autumn2012, Vol. 44 Issue 2, p155-170.	Australia, conceptual case study, broader political effects of CBT (type ii)
2004	[DOUBLE] Competency-Based Behavior Consultation Training: An Evaluation of Consultant Outcomes, Treatment Effects, and Consumer Satisfaction. By: Kathy Lepage; Thomas R. Kratochwill; Stephen N. Elliott. School Psychology Quarterly. Spring2004, Vol. 19 Issue 1, p1-28.	US, empirical, small scale (24 consultants, 39 clients: teachers, parents, consultation skills, client behaviour (type i)
1999	Ten years of competency-based training: the experience of accredited training providers in Australia. By: Smith, Erica. International Journal of Training & Development. Jun99, Vol. 3 Issue 2, p106.	Australia, summary of two projects, 1990s, effects of CBT (type iii)
1999	How Competency-based Training has Changed the Role of Teachers in the Vocational Education and Training Sector in Australia. By: Smith, Erica. Asia-Pacific Journal of Teacher Education. Mar99, Vol. 27 Issue 1, p61.	Australia, summary of research project about effects of CBT (type iii)
1972	The Effects of Competency-Based Training on the Performance of Prospective Teachers. By: Waimon, Morton D.; Bell, Dennis D.; Ramseyer, Gary C. Journal of Teacher Education. Summer1972, Vol. 23 Issue 2, p237-245.	US, empirical, teachers, microplanning, microteaching (type i)

B. search TITLE 'outcome-based education/training, 'effect…' FOUND IN ABSTRACT

Year	Title, Autors, Source	Methodology, remarks
2013	[DOUBLE: Outcome (competency) based education: an exploration of its origins, theoretical basis, and empirical evidence. By: Morcke, Anne; Dornan, Tim; Eika, Berit. Advances in Health Sciences Education. Oct2013, Vol. 18 Issue 4, p851-	See above

863.]

2009	[DOUBLE across] Does an outcome-based approach to continuing medical education improve physicians' competencies in rational prescribing? By: Esmaily, Hamideh M.; Savage, Carl; Vahidi, Rezagoli; Amini, Abolghasem; Dastgiri, Saeed; Hult, Hakan; Dahlgren, Lars Owe; Wahlstrom, Rolf. Medical Teacher. Nov2009, Vol. 31 Issue 11, pe500-e506.	See above Tab.5a
2007	Outcomes based education? Rethinking the provision of compulsory education in Western Australia. By: Berlach, Richard G.; McNaught, Keith. Issues in Educational Research. Apr2007, Vol. 17 Issue 1, p1-14.	Australia, review, compulsory education, broader effects on education
2004	[DOUBLE] Competency-Based Behavior Consultation Training: An Evaluation of Consultant Outcomes, Treatment Effects, and Consumer Satisfaction. By: Kathy Lepage; Thomas R. Kratochwill; Stephen N. Elliott. School Psychology Quarterly. Spring2004, Vol. 19 Issue 1, p1-28.	See above
2000	Effects of a shared vision on the attitudes of teachers towards outcomes-based education. By: Singh, P.; Manser, P.G. South African Journal of Education. May2000, Vol. 20 Issue 2, p108.	South Africa, education staff, broader effects (attitudes, leadership, etc.)
1999	Empowerng or Ensnaring?: The Implications of Outcome-based Assessment in Higher Education. By: Ecclestone, Kathryn. Higher Education Quarterly. Jan1999, Vol. 53 Issue 1, p29.	U.K., review, higher education, GNVQ, broader effects (attitudes teachers, students)
1994	The possible outcomes of outcome-based education. By: McGhan, Barry. Educational Leadership. Mar1994, Vol. 51 Issue 6, p70.	US, forecasting effects of OBE
1985	Making Outcome-Based Education Work. By: Abrams, Joan D. Educational Leadership. Sep85, Vol. 43 Issue 1, p30.	US, regional effects (type iii)

Source: Searches in EBSCOHOST Jan 2015 [searches A, B in http://www.equi.at/dateien/cybet-obet.pdf]

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