HEIK, Department of Educational Research, University of Oslo
http://www.uv.uio.no/english/research/groups/heik/

NIFU – the Nordic Institute for Studies in Innovation, Research and Education
http://www.nifu.no/Norway/Sider/default.aspx

2011
Preface

This report is the outcome of a pre-project funded by “Utdanning 2020” - a research program organized and led by the Research Council Norway. The aim of the pre-project has been to pave the way for future research on learning outcomes in higher education, through a discussion of the theoretical foundations of the concept and the key existing data sources available in Norway.

The pre-project is a result of a collaboration between the Department of Educational Research at University of Oslo, and NIFU – The Nordic Institute for Studies in Innovation, Research and Education. These two research milieus have a long history of theoretical and empirical studies on learning and various outcomes of learning processes in higher education, and the idea behind the collaboration is to further strengthen future research in this area combining theoretical developments and sophisticated empirical analysis. We are grateful to professor Lee Harvey who commented an earlier version of this report in a seminar at the University of Oslo on the 11th of October.

The interest in learning outcomes will probably increase in the coming years, due to the steady increase in the number of people with higher education qualifications, international mobility of students and employees, and the strong demand for talent in the labor market. In this situation research into what they key learning outcomes are, and how they might be effectively measured, could play an important role as a critical and constructive element in building our future knowledge societies. However, as our report indicates, we need to improve both the theoretical and empirical foundation surrounding the concept of learning outcomes before research can play such a role.

Oslo, December 2011

Bjørn Stensaker

Project leader, Department of Educational Research, University of Oslo
1 Introduction

Quality can be said to have been a key concept in higher education policies since the latter part of the 1980s, and it is often associated with a shift from an input-oriented focus in higher education, to more output and results-orientations among policy-makers (Ball 2009). This shift has had several consequences for the governance of the sector, and for practises that are intended to stimulate student learning. The dominant approach to quality in Europe and Norway has been to establish national systems for quality assurance, with external agencies mandated to evaluate and assess both subject areas and study programmes, at various level (Schwarz & Westerheijden 2004). The second phase of this development emphasised the responsibilities of higher education institutions themselves to ensure student learning, through the establishment of internal quality management systems (Pratasavitskaya & Stensaker 2010).

Although quality assurance ideas have had several effects within higher education, not least with respect to how study programmes are managed and led, supported and reported upon, these procedures have not led to convincing evidence of improved student learning (Stensaker 2008). This is perhaps one of the drivers for the latest initiative to improve quality – and student learning – in Europe, the establishment of national qualification frameworks.

In Norway, the implementation of a national qualification framework is underway, and is scheduled to be completed in 2012. In a national qualification framework, learning outcomes are usually described along three dimensions (knowledge, skills and competences) focusing on different levels of knowledge.

The rationale of a qualification framework is threefold (Adam 2004). First, it is intended as a planning tool for higher education institutions in their development of existing and new study programmes. Second, it offers documentation of what students have learned and the competences they have acquired through their studies, documentation that is important in a life-long learning perspective. Third, it is seen as a relevant tool for informing employers in the labour market about graduate abilities, supporting the ultimate aim of stimulating a more flexible and mobile work-force.

However, the introduction of a qualification framework in Norway is likely to be a challenging task, both concerning the organisational aspects of the project, and concerning debates around how learning outcomes should be understood and assessed, not least empirically. The focus of this report is especially directed at how learning outcomes can be understood, operationalized and measured empirically. Hence, the objectives of this report are to:

- Identify and discuss various theoretical perspectives related to learning outcomes; and,
• Critically assess how different perspectives are empirically measured and linked.

As part of our project an additional aim will also be to identify existing macro- and meso-level data on learning outcomes in the Norwegian higher education system, and discuss the potential of these data as inputs for a broader and more thorough theoretical and empirical understanding and analysis of student learning.

2 Learning outcomes as a theoretical term and concept

Within the literature on learning outcomes, there is considerable disagreement about how the concept should be understood and measured (Eisner 1979, Allen 1996; Adam 2004, Prøitz 2010), but also how it can be understood in terms of learning. Hence, any discussion on learning outcomes as a theoretical term or concept is usually closely linked to a discussion about the concept of learning. We would argue that attempting to discuss issues of learning outcomes without discussing learning is probably a challenging, if not an impossible and meaningless task. At first glance this can be explained by the implicit link between learning outcomes and learning, where the latter is considered to be a condition for the former. Hence learning outcomes, seen as a result or product, appear to be a function of a prior learning process. Such an understanding of learning outcomes is based on the assumption of a linear and causal relation between inputs - an object to be learned and a learning process - and identifiable outputs which are understood as a direct consequence and evidence of the foregoing process. The concept of learning has in this respect been widely used as a commonplace concept with few references to definitions and documentation within established learning and educational theories. Based on this void in the theoretical discussion, the following sections will explore some possible connections and connotations between the concept “learning outcomes” and established theoretical perspectives on learning.

The contribution of learning theories is that they represent a logic about and an analytic framework for how to study learning processes. The aim of using these theoretical constructs here is therefore to provide us with more elaborated understandings about how people learn and especially the way students go about learning via organized and institutionalized activities.

Hence, while learning theories only provide an in-direct approach to the study of learning outcomes, emphasising learning theories can shed light on different contextual and individual dispositions that may enhance and encourage different sorts of learning outcomes. In this way learning theories offers an analytical approach for drilling deeper into the conceptual foundations of learning outcomes (knowledge, skills and competencies). If we are entering an era where Qualification Frameworks (QF)
are expected to play a more central role in advancing the links between education, training and the labor market, we will need a better theoretical understanding of these links.

In order to understand learning outcomes in light of programme intentions and aspirations, this approach also needs to be supplemented by a curriculum theory perspective, which sets out the way subject knowledge is approached through learning goals, content, instructional activities and assessment. This last aspect of curricular theory and how this relates to learning outcomes will be addressed in the next section, once we have set out key points regarding learning theories.

2.1 Theories of learning and their link to learning outcomes
Key aspects of learning theories are that they represent coherent explanations and sets of relationships, which are observable and testable on basis of scientific experiments and empirical documentation (Bransford, Brown, & Cocking 2001). The most prevalent learning theories are thus conceptually rigorous, representing comprehensible explanations of learning which have been developed over time, through thorough empirical testing and contestation. However, the field of research on learning and learning theories also comprise a number of opposing perspectives promoting different ideas and explanations on learning. In this respect, learning theories appear, to some extent, to be epistemologically and methodologically compartmentalized.

However, learning is generally recognized as a comprehensive phenomenon involving a wide range of processes and environmental factors. While most learning theorists acknowledge this comprehensiveness, the room for diversity and complexity also appears to act as a catalyst for competing learning perspectives. In educational research, learning is commonly defined as a process where a subject changes on the basis of attained knowledge, skills and values. The notion of change is here related to how the subject behaves or potentially behaves (ref). Learning is always multifaceted, a feature which the following definition by Knud Illeris (2004) clearly conveys:

The most fundamental assumption of the learning theories is that all learning includes two essentially different types of processes: (a) an external interaction process between the learner and his or her social, cultural, and material environment and (b) an internal psychological process of elaboration and acquisition in which new impulses are connected with results of prior learning (Illeris, 2004: 81).

The definition above is wide-ranging and could cover a number of different learning theories and perspectives. It is important to note, however, that this particular definition emphasises learning as a process. This complexity in learning as a phenomenon in part explains the diversity found across theoretical perspectives on learning. In trying to grasp this diversity, the following discussion is limited to three clusters of the most influential learning theories: behaviourist, cognitivist and socico-cultural perspectives.
2.1.1 Behavioural perspectives

Behavioural perspectives on learning are based on the core assumption that thought and emotions are unapproachable through scientific research. This limitation means that the researcher can, and should, only to study observable behaviour (Atkinson et al. 2000). This emphasis on studying behaviour also conveys ambitions of engaging in more objective scientific approaches to these issues.

A somewhat simplified description of behavioural perspectives is offered by thinking of them as embedded in three main principles. First, that learning is revealed through changes in the person’s behaviour. Second, that change in behaviour is a function of environmental influence; and third, that learning is a function of contiguity and reinforcement which is the essential explanation of how learning occurs. This last notion of contiguity and reinforcement is established in the theories of classical conditioning (Pavlov) and operant conditioning (Thorndike, Skinner) (Bransford, Brown, & Cocking 2001).

The central idea in this perspective is that nearly all behaviour is a result of environmental conditioning and that this environmental conditioning shapes us, reinforcing or creating new behavioural habits. A main critique against this perspective is that its strict preoccupation with observable behaviour leads to the neglect of a wide range of vital psychological processes, such as consciousness, memory and emotions, factors which are widely seen as essential in a deeper understanding of human learning. Before going further into this critique, a quick comparison between the notion of learning outcomes and behaviourism might prove interesting, here based on Kennedy et al.’s definition of learning outcomes:

Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of a process of learning (Kennedy, Hyland & Ryan 2006: 5).

On the one hand, this portrayal of the learner being able to demonstrate outcomes after completion of a process of learning resembles the behavioural notion of learning as changes in observable behaviour. On the other hand, the statement also indicates through the emphasis on knowledge and understanding a behavioural perspective includes may lead to difficulties in providing a full theoretical coverage of this definition of learning outcomes. This brings us to cognitive perspectives on learning.

2.1.2 Cognitive perspectives

In contrast to the focus on observable external behaviour, the notion of cognition refers to internal mental and intellectual processes, such as perception and thinking. Cognitive perspectives on learning emphasise what the learner does in processing and organizing information and also the role prior knowledge and understanding plays in the acquisition of new information. This perspective emerged as a critique of the behaviourist position in psychology and its promotion of behaviour as
the only firm way of explaining the learning process (Atkinson et al. 2000, Schunk 2011). Cognitive theorists emphasised the role of problem solving in learning, different ways of information processing and cognitive load in short term and long term memory, as well as developing studies on learning of cognitive maps and abstract concepts (Schunk 2011).

Cognitive perspectives have influenced ideas about how students approach learning in higher education by bringing in intelligence, but also by describing how students learn via their own learning strategies (Biggs 1987, 2003). Studies investigating this notion of learning strategies have documented that learning results are strongly related to how students approach learning and that the development of learning strategies has a positive effect on student motivation (Convington 2000). There is also evidence of a relationship between students’ conceptions of learning and their learning outcomes, which to some extent differentiates student performances with respect to deep-versus surface-oriented learning strategies (Purdie, Hattie & Douglas 1996, Ramsden 2003).

In summary then, cognitive theories emphasise what learners’ thoughts, beliefs, attitudes and values bring to the learning process. Questions such as what the purpose of learning a subject might be or how confident a learner feels, which are of minor interest in behaviourist perspectives, are considered important influences on learning in cognitive perspectives (Schunk 2011).

This focus on cognitive aspects in learning has also been embedded in certain assessment theories, setting out how learned knowledge can be measured and evaluated. The most influential contribution in this respect is the Taxonomy of educational objectives: the classification of educational goals (Bloom 1956). This publication presents three domains of learning: cognitive, affective and psychomotor, with the cognitive domain appearing to be the most influential of the three by far.

Bloom’s taxonomy in the cognitive domain presents a hierarchical structure of complexity, over six levels. The lowest three levels start with knowledge, comprehension and application, while the three highest levels are (in ascending order) analysis, synthesis and evaluation. In order to avoid confusion due to the notion of knowledge being lowest in the taxonomy, the classification-concepts were later revised into remembering, understanding and applying at the lower level and analysing, evaluating and creating at the higher levels, as seen in the model below:
Figure 1: Revised model also termed as the SOLO-taxonomy (Anderson & Krathwohl 2001)

This taxonomy has provided educators with a systematic classification of knowledge achievement and mastery. The following table elaborates on the meanings of the specific categories in the model in more detail and describes how they are related to each other:

Table 1. Categories and relations in the SOLO-taxonomy.

<table>
<thead>
<tr>
<th>Category-level</th>
<th>Category-definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Creating:</td>
<td>a broad range of knowledge and experience which allows one to extend the boundaries of knowledge. This requires highly developed foresight and meta-cognitive understanding.</td>
</tr>
<tr>
<td>5. Evaluating:</td>
<td>to apply knowledge in order to measure a situation in terms of its broader context and in relation to determining future outcomes. This allows results to be weighed up in terms of decision making and a broader managerial context. Evaluation comes from experience.</td>
</tr>
<tr>
<td>4. Analysing:</td>
<td>to be able to apply knowledge in a critical way using a level of awareness that allows one to explain the results—i.e. to reconstruct how the result was achieved. Decision making comes out of analysis. Analysis comes from an analytical approach but can involve a lack of experience.</td>
</tr>
</tbody>
</table>
| 3. Applying:   | to be able to use knowledge in an appropriate context in order to achieve a desired
result in a predictable way.

<table>
<thead>
<tr>
<th>2. Understanding:</th>
<th>to be able to comprehend something in its context and make associations between things.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Remembering:</td>
<td>to know something exists and where to find it.</td>
</tr>
</tbody>
</table>

(Anderson and Krathwohl, 2001: 67–68)

This taxonomy is cumulative in the sense that accomplishments on a higher level presuppose mastery of those at a lower level. In general, what this classification represents is a set of categories related to the evaluation of students’ academic achievements (Hutchins & Corr 2011). This taxonomy is used in grading and examination systems in higher education, and so actively contributes towards standard principles for identifying levels of cognitive achievements (Lindberg-Sand 2008). This is a clear step towards a description for outcomes of learning with a clear theoretical basis, in contrast to learning outcomes, which is a more a-theoretical term. The following citation confirms as well as it problematizes this relationship:

Bloom’s taxonomy is frequently used for writing learning outcomes as it provides a ready-made structure and list of verbs. These verbs are the key to writing learning outcomes. Bloom’s original list of verbs was limited and has been extended by various authors over the years (Kennedy, 2007: 26).

Kennedy pinpoints the significance of the SOLO-taxonomy in educational practices. This use is to a large extent related to the set of evaluative verbs, referring to how the learner acts with the knowledge, i.e. at what taxonomic level the learner is able to display their learning. A reasonable doubt regarding this assessment and knowledge evaluation practice is that the use of such a taxonomy arguably accepts the cognitive learning paradigm. Hence, as the argument above illustrates, taxonomies should not be seen as theoretical constructs but as being closely related to different theories and perspectives.

The cognitive perspective has also been criticised for approaching learning too narrowly, as something that resides unevenly on students’ minds, by separating the acquisition of knowledge skills and understandings from their application, and underestimating the significance of social context and how this context influences what is learned and the way learning takes place (Kelly 2006: 506-507).

2.1.3 Socio-cultural perspectives
As a reaction to criticisms of cognitive perspectives on learning, socio-cultural perspectives have gained much ground in recent decades (Wertsch 1998, Lave & Wenger 1991, Wenger 1998, Valsiner

---

1 The aspect of cumulativeness has been somewhat debated concerning what degree of knowledge is needed in order to achieve on a higher level.
While one indeed can identify a number of theoretical positions under this broader umbrella, Kelly (2006: 507) has pointed out that they often rest on some shared, key assumptions.

The basic assumption in socio-cultural perspectives is that learning involves a change in consciousness that is created through participation in cultural practices (Roth & Lee 2008). Learning is here described as something that emerges through a person’s engagement with culturally meaningful resources, such as material tools or symbolic sign systems. Action with resources is, in this perspective, always something that gains meaning within specific social contexts. Hence, the learner in an educational setting creates meaning and transforms his/her knowledge structures through participation in lectures and other learning activities. The subsequent knowledge performance is seen here as an action that is not necessarily related to knowledge as an abstract and de-contextualized entity, but achievements such as handling theory in an educational setting, which is seen in itself as a form of practice (Engeström 1999).

In this respect, learning takes place through the interaction of knowledge-in and knowledge-of-practice, indicating that learning relates to an expectation system built up of community values, stakes and positions. Learning thereby also involves the handling and breaking of hidden codes revealed during social interactions, for example between students or between students and teachers. As a consequence, learning outcomes appears as a complex composition established during social participation, making it difficult to identify and pre-define specific learning outcomes.

Hence, socio-cultural perspectives tend to emphasise that the identity of the learner is important for learning to take place (Wenger 1998). When learning takes place through social interaction, the attitudes, motivations and identities of the learners become part of the learning process, as a form of transformation of the knowing. This outcome of the learning process is the main factor enabling the learner to move from being a novice to an expert member of the community (Kelly 2006: 514).

Another interesting conceptual aspect related to the socio-cultural perspective refers to Lev Vygotsky’s notion of the *zone of proximal development*. In simple terms, the zone of proximal development describes the distance between the actual developmental level (of the learner) achieved by independent problem solving and the level of potential achievement through problem solving under more competent guidance or collaboration (Vygotsky 1978: 85). This zone therefore signifies a specific level of performance but also possibilities for further learning and higher achievements, as illustrated in the following model:
This model thereby incorporates a set of expectations for higher performance levels than the learner is capable of achieving solitarily, but thereby opens up the notion of learning outcomes as phenomena that take place though collaboration (Daniels 2001). In this respect the learner’s achievements might be opened up towards considerations of evaluation systems that also measure collective performance and prospects for collaborative learning achievements.

2.1.4  A short summary

As indicated in this short introduction to different perspectives on learning, the theories associated with these different perspectives are quite complex, and could be characterised as somewhat compartmentalized. However, as indicated in the description, they all shed some lights on the standard definition of learning outcomes: different learning theories can indeed be linked to different dimensions in the learning outcome concept.

While the compartmentalization of different learning theories may seem to be a disadvantage with respect to the possibilities of advancing more integrative and cumulative knowledge on learning per se, this situation can also be seen as advantageous with respect to the recent interest in learning outcomes; while the idea of a learning outcome emphasises what the learning process has accomplished – what has been learned (which may or may not provide input into how learning should be facilitated), the idea behind learning theories is to emphasise the learning processes (which may or may not lead to a range of learning outcomes). However, whether it is theoretically and empirically possible to distinguish sharply between process and outcome is an open question. We would argue that a pragmatic way forward is to treat these learning theories and the concept of learning outcome as complementary perspectives which potentially can provide us with a better understanding of how learning takes place, and what comes out of learning activities.
2.2 Curriculum perspectives on learning outcomes

One possible way to try to combine learning theories and learning outcome ideas could be to relate them to educational programme intentions and aspirations. By doing so, we are entering into curriculum theory perspectives. In general, the curriculum can be defined as an "academic plan" for how teaching and learning is to take place (Stark & Lattuca 1997). Such a plan can be expected to include decisions about what, why, and how students learn; ways to determine whether students have learned what they are supposed to learn; and, methods for using this information to further improve the plan (Stark & Lattuca 1997).

While many academics tend to interpret curriculum in terms of the academic content and specific subject matters to be dealt with (Stefani 2009), there is a growing recognition that curriculum design should include an understanding of student learning, and the processes by which this is facilitated and assessed. The perspectives on learning identified in the previous section are therefore important here, as they provide necessary inputs to this understanding.

However, in practice, curriculum design has tended to address these kinds of issues only implicitly, emphasising how a given academic plan can be integrated both concerning what is learned – i.e., the cognitive ability of the learner (Bloom 1979), and the coherence between the different phases in the learning process (Biggs 1999). For example, Bloom’s (1979) taxonomy has been used as a starting point for structuring learning outcomes along concepts such as: knowledge, comprehension, application, analysis, synthesis and evaluation (see McLean & Locker 2006). As such, Bloom’s taxonomy clearly has strong links to the cognitive perspective of learning presented above.

However, if we assume learning takes place through social interactions both between students and between students and teachers, one could argue that curriculum design also needs to imply an understanding of how teaching methods are selected, how we assess what is learned, and the general climate created through interactions with students (Biggs 1999). Bigg’s (1999) concept of “constructive alignment” – the linking of study design, learning activities and their evaluation - is often emphasised as a key way to make the different dimensions and phases in the academic plan more coherent. The idea of constructive alignment is somewhat difficult to position in relation to the perspectives of learning identified here. On the one hand, constructive alignment does include dimensions which socio-cultural perspectives also includes, such as how interaction between teachers and students take place, and the social climate surrounding the learning process. On the other hand, constructive alignment can also be seen as a very rationalistic perspective on how curricula are developed. Hence, in handbooks on curriculum design the concept of constructive alignment is often used as means to propose a “logical model” for curriculum development where it is assumed that the learning content is always known in advance, and that it is, as a consequence, quite straightforward to design a curriculum that matches it (see Stefani 2009: 50 for an example). This approach is closely aligned with the political ambitions of qualification frameworks (Adam 2004) which typically sees learning outcomes as pre-defined objectives about what successful students are
expected to do after completing a specific type of training. In such approaches, the learning outcomes should be formulated as “statements of what a learner is expected to know, understand and/or be able to do at the end of a period of learning.” (Bologna Working Group on Qualifications Framework 2005: 29). However, if “what is known” also changes as a consequence of the learning process itself – as assumed in a socio-cultural perspective – it becomes more problematic to apply such models to guide curriculum development.

2.3 Key challenges in conceptualising learning outcomes

Based on the discussions above, we can identify two major challenges when moving from more theoretical perspectives on learning outcomes to process of operationalisation and measurement.

First, that cognitive and socio-cultural perspectives on learning emphasise that undertaking higher education is a process that is closely tied to institutions’ practices and their local conventions (Lave & Wenger 1991; de Jong & Pieters 2006), making it too difficult to pre-define specific learning outcomes (Eisner 1979). The deliberate strengthening of the contact between higher education and employers, professions, and other stakeholders also brings questions related to new forms of professionalism, challenging ethical considerations and the need for critical thinking to the forefront of the learning process, implying that the formation of students is a process that should not be underestimated (Sullivan & Rosin 2008). The point made in social-cultural perspectives is that learning is a process in which a number of institutional stakeholders and participants interact and influence curriculum design, curriculum interpretation and learning outcomes, these stakeholders including not least the learners themselves. This perspective can be said to be especially relevant in documenting how higher education handles, interprets and makes sense of governmental instructions and decrees, such as the qualification framework, by adding local measures into the implementation process.

While one could indeed argue that such measures can also be formulated within a behaviourist and a cognitive perspective, the socio-cultural perspective tends to interpret “quality”, “knowledge” and “learning” as more dynamic concepts, that are subject to continuous change and re-interpretation within a larger social community. This latter perspective emphasises how institutional practices are important in the student formation process and is therefore vital to include in the analysis of learning outcomes (Arnseth & Ludvigsen 2006; Engeström 2008).

However, a second challenge, as illustrated in our discussion of curriculum design, is that difficulties related to identifying learning outcomes often have to be put aside in practice, when political authorities, institutions and students expect specific objectives to be set out for curricula, study programs and subject areas (Allan 1996: 94). While pre-defining learning outcomes can be challenging, institutions, departments and academics are nevertheless expected to provide specified objectives. The question of interest then becomes is it possible to formulate educational objectives that are both meaningful and measurable, and that take into account the possibilities of more open-ended learning? This issue will be addressed below.
2.3.1 Outcomes and objectives

In general, educational objectives typically express educational intent, but there are a myriad of potential definitions. Allan has identified significant stages in approaches taken to the specification of objectives: educational objectives presented by Tyler in the 1950s, instructional objectives presented and discussed by Mager and Popham et al. in the 1960s, behavioral objectives described by Macdonald-Ross in the 1970s, behavioral and non-behavioral objectives described by Cohen and Manion and expressive objectives set out by Eisner in the late 1970s. Differences between these groupings lie in who and what the objectives are directed at, meaning teachers or students, behavioural aspects and/or content aspects and specifications of conditions and standards defining levels of performance (Allan 1996:106).

One important and much debated difference between understandings of objectives with strong relevance for learning outcomes is their link to behaviourist theories. As Allan points out, there is an inconsistency in Tyler’s use of educational objective as it connotes a broad, holistic development of the learner whilst at the same time he emphasizes the importance of specifying contextualized, observable behaviours (1996:95). On the other hand this inconsistency “…was removed by the shift from the use of the term educational to instructional objectives…” thereby emphasizing the link between the achievement of objectives as a direct result of instruction presented in Mager’s work. According to Allan, the position of Mager represented a more systematic and mechanised approach to curriculum design than Tyler’s. She sees Mager’s definition of objectives as a psychological approach, not a curriculum approach as was typically dominant in the development of curriculum planning in the 1960s. In this decade educational science was often seen as a more technologist activity, influenced by the positivist paradigm (Allan 1996:95). Nevertheless, Mager brings in another important clarification as he sees objectives as a specification of what a student achieves and so brings the student closer into the framework of curriculum design, as a participant in the process of education.

With this thematic shift the use of the term behavioural objective is brought forward, which clarifies both the relationship between the learner and the teacher, and between instruction and learning: “The term behavioural emphasizes that the changes in student behaviour, the objectives which are measured and celebrated, are those which result directly from the interaction of learner and teacher” (Allan 1996:96), which arises from the learning experience as such. The adoption of the term behavioural to replace instructional objectives reflected an increased emphasis on the student (Eisner 1979:105). Furthermore, the term underpinned a new sense about what counted as legitimate outcomes, expressed in very tightly pre-specified manner and based on observable actions. This triggered a strong reaction against the notion of objectives in education. In its strongest form extreme rational planning was rejected and seen as reductionist (Allan 1996: 97, Burke 1995: 65) with critics noting that “this atomization was and remains an anathema, particularly to those involved in curriculum design in higher education, where a high level of analysis and synthesis is implicit in what constitutes learning in undergraduate study” (Allan 1996: 97). This remains a
common view expressed by those who argue against the increased use of learning outcomes in higher education. This view manifests an understanding of learning outcomes as something primarily applicable to teaching and learning in lower education, or involving the acquisition of lower cognitive skills and comprehensive knowledge (Hussey and Smith 2003, 2008, Buss 2008, Entwhistle 2005).

2.3.2 Diversity of outcomes and objectives

The link between current understandings of outcomes and the understandings of objectives throughout time in education signals a change in focus from defining education through what teachers are to be teaching (the intent of the activity) to what students are to know (the result of an activity). In this way, an outcomes based approach is seen as embracing the perspective of students and student learning (Otter 1995, Eisner 2005). At the same time outcomes based approaches have been heavily criticized and even rejected for being reductionist and fragmented, due to links made to behaviouristic perspectives on learning (Stenhouse 1975, Smyth and Dow 1998, Hussey and Smith 2003, 2008). Burke (1995:56) explains this argument: “As learning outcomes clearly is linked to objectives it shares many of the assumptions and principles of different objectives models and it is subject to similar criticisms”. Nevertheless Burke goes on to argue that objective models “which rely on behavioral evidence in making assessment, are not dependent on the Behavioral Psychology…” understood as a kind of “Skinnerian” type of behaviorism described as: “experimentation of behaviour under laboratory conditions and where subjects are passive and with limited freedom” (1995:65).

Burke also points out that there are outcomes approaches based on objective models directed at liberating and empowering students, rather that controlling and modifying their behaviour (1995:67). Nevertheless a central question remains about how loosely coupled objective models and behaviourism can be regarded as being. The non-behaviourist objectives described by Cohen and Manion in the late 1970s contain features like understanding and critical thinking, which are hard to express in behavioural terms and hard to assess. Contemporary outcome theories, both in the UK (Jessup 1989, 1991) and USA (Spady 1991, 1994) are characterized by their advocates as approaches that: are applicable to all forms of learning, provide open access to learning to far more individuals and lead to efficient and cost effective learning. Significant features of these theories are that learning objectives are specified as outcomes independent of learning and assessment processes, and that this allows different modes, contexts and time scales for learning to be used, leading to the argument that “The primary benefits of the outcomes model can thus be summarized as access, flexibility and relevance” (Jessup 1995:36). However pre-specification of objectives or standards for what students should know at the end of a program of study is not only required to assess and judge accumulated evidence of student learning, but also as a guide for the development of the curriculum and content of that program. In outcome-based education, the outcomes agreed in the curriculum guide what is taught and what is assessed (Harden et al. 1999). Objective-based education, therefore, is not simply a “program” but a way of designing, developing, delivering and documenting instruction in terms of its intended goals and outcomes (Spady 1988).
2.4 Toward measurement

Researchers searching to avoid excessively narrow interpretations of the term learning outcomes have established other labels such as “outcomes of learning” to make a distinction between the traditional label and research into all products of learning (Buss 2008:306). Eisner suggested separating between objectives (which imply pre-specified goals) and outcomes “which are essentially what one ends up with, intended or not after some form of engagement” as a way of making it clear that outcomes are a more general and overarching label than objectives (1979:103). He also proposed the use of expressive outcomes, defined as outcomes of learning where purposes are formulated in the process of action itself, as a kind of emergent outcomes that becomes more clear during the learning process. Other types of outcomes with a wider scope are: intended outcomes, specified at the beginning of learning which are used extensively across higher education; holistic outcomes that encompass ways of thinking and practicing which may not be evident until the end of, or even after, the learning has been completed (and therefore represent a challenge to assessment); and, ancillary or emergent learning outcomes described as outcomes above those that are specifically related to the main objectives, or value added learning resulting from the learners “own unique journey” (Buss 2008:307, Entwhistle 2005).

Adam (2004) points out that there may be a common understanding of learning outcomes, which fit within a broader framework. He also shows that several of these definitions are not significantly different from each other; based on these he defines learning outcomes as “a written statement of what the successful student/learner is expected to be able to do at the end of the module/course unit, or qualification” (Adam 2004: 5). This definition is not unlike the one used in the Bologna framework: “Statements of what a learner is expected to know, understand and/or be able to do at the end of a period of learning”, and that used in the European Qualification framework: “Learning outcomes are what a learner knows, understands and is able to do”. Nevertheless, Adam also points out that when it comes to practical application “there are possibly confusions between learning outcomes, objectives and aims” (2004:19).

Another study of definitions made by scholars within the field of education, shows that there seems to be a dominant definition of the concept of learning outcomes, while a substantial number of distinct, alternative definitions remain present (Prøitz 2010). Inspired by the theoretical contributions on learning outcomes of Eisner (1979, 2005) and Gagne (1974), a theoretical and analytical framework was developed and applied on the material.

According to Gagné, a learning outcome “makes possible a refined understanding of the learning process and thus permits a drawing of relatively precise implications for the design of instruction”

---

Eisner writes that learning outcomes are “essentially what one ends up with, intended or not, after some form of engagement” (1979:101). Gagné is recognised as a behaviourist (Burke 1995), while Eisner is considered a pragmatist and social constructivist (Allan 1996). Hence, Gagné and Eisner represent two different perspectives on learning which are accompanied by different perspectives on the outcomes of learning. Their approaches are also quite different and this has naturally influenced their contributions. The late Gagné was concerned with instructional design and in determining the kind of learning required to accomplish certain tasks involving planning and sequencing, and as such was engaged in moving from a behaviourist to a more cognitive approach (Burke 1995:59). Eisner is concerned with the role of the curriculum in learning and has defined a “trichotomy of outcomes”. According to Eisner, outcomes are partly dependent on the student, partly on the subject in question and partly on the teacher: this makes it impossible to sort all learning into pre-specified terms (Allan 1996). These two classical contributions of Eisner and Gagné capture two main views on the debates around the issue of learning outcomes: they disagree on whether learning and the outcomes of learning can, and should, be stated in closed, stable, pre-specified and measurable terms, or alternatively, in open-ended, flexible terms with limited opportunities for measurement.

Gagné and Eisner’s definitions and perspectives of learning and learning outcomes may be viewed as two opposite poles of a continuum where learning outcomes are either characterized as process-oriented, open-ended and with limited ‘assessability’ (Eisner) or result-oriented, full-ended and assessable (Gagné). The continuum represents a range of “learning orientations” to the concept of learning outcomes (see figure 3).

<table>
<thead>
<tr>
<th>Process oriented, open ended, wide and general objectives, limited assessability</th>
<th>Result oriented, full ended, pre-specified objectives, assessable</th>
</tr>
</thead>
</table>

Figure 3. Learning outcomes understood as a continuum

Such a model opens up possibilities for investigation, categorization and analysis of different types of learning outcomes dependent on their relation to the perspectives of learning discussed earlier. The model can be said to encompass behavioural, cognitive and socio-cultural perspectives of learning – although a precise positioning of the perspectives in the model is impossible. For example, at first
glance the cognitivist perspective can be placed at the middle of the continuum, but this is not a straight forward issue as the outcomes may be directly observable and scientifically measured, or completely hidden and assumed. Cognitive perspectives on learning might emphasise mental processes (including insight, information processing, memory, perception) where, in order to develop learner capacity and skills to improve learning, the educator structures the content of learning activities to focus on building intelligence and cognitive and meta-cognitive development (Bruner 1966, Bloom 1956). The process consists broadly of determining the current state and needs of the learner, defining the end goal of instruction, and creating some "intervention" to assist in the transition. Often this kind of instruction is exemplified by teaching learners how to learn or teaching different types of strategies for acquiring knowledge.

2.4.1 An example of the model in use
By using the framework of the definitions selected and described in the previous study set out, two clusters of definitions emerge, which can be referred to as established and alternative definitions of learning outcomes (Prøitz 2010). Alternative definitions of the term learning outcome are often the result of a critique of established definitions, which describe the term learning outcome as results-oriented, closed and measurable. Established definitions are often politically embedded or historically rooted, and often share similarities with key ideas from behaviourism, the objectives movement, the curriculum planning movement, or the mastery of learning movement. The definitions used often posit that a learning outcome is a written statement of intended and/or desired outcomes that should be manifested by student performance. The formulation of learning outcomes and the establishment of criteria for assessing (formative and summative) attainment of predefined learning are essential. The alternative definitions are rooted in more open-ended perspectives on learning, such as cognitive and socio-cultural theory. One key conviction found in alternative definitions is that all learning cannot be reduced to written, pre-specified statements of outcomes. Another is that it is impossible to cover all learning by pre-specified learning outcomes and thereby impossible to measure all learning. Hence the different orientations towards learning outcomes imply drastically different values about, and perspectives on learning.

The development of higher education has brought additional purposes for the use of outcomes, supplementing traditional educational planning and curriculum development with steps for measuring institutional effectiveness, establishing accountability and for clarifying the expectation of a closer relationship between higher education and society. Hence, learning outcomes have acquired a dual purpose as a tool for tracking both individual outcomes and institutional outcomes (MacBeath and Moos 2010) and we would argue that any attempt to operationalise and measure learning outcomes needs to take into account this duality between individual and institutional needs.
3 Measuring learning outcome

As the discussion so far indicates, there are few distinct demarcations between the theories. It is more a continuum from the process oriented, open-ended understanding of learning outcomes, with wide and general objectives and limited measurability to the result oriented approach, where goals are pre-specified and easily assessable, as illustrated in figure 1. The way forward in operationalizing the learning outcome theories is thus hard to find by trying to apply the theoretical perspectives directly. A more realistic approach is to try to overview approaches already used and try to point out potential improvements. However, the approaches used all have their background in different theoretical perspectives, although not always explicitly stated.

Karlsen (2011) discusses how learning outcomes have been measured in higher education, and how international research traditions have influenced Norwegian research on learning outcome, and this review will be used as a starting point for the discussion. In Norwegian research, the measure of learning outcome is described as a relatively new field, and the measurement of learning outcome varies according to educational level. In primary and secondary school learning outcome is measured by grades and scores on national tests measuring the students’ performance in core subjects. In research on upper secondary school learning outcome has been measured as achieved certification (general university and college admissions certification, vocational qualifications or vocational training certificate) and grades. Karlsen argues that learning outcome as a theoretical concept has not been much used in research on higher education in Norway. But internationally a large research body exists where measurement of learning outcome is both discussed and operationalized.

In the following sections some of the important insights from the international discussion will be presented and discussed, before moving on to more specific methodological aspects in measuring learning outcome. Finally, relevant existing Norwegian data sources will be presented, and their advantages and disadvantages will be discussed, as well as their potential for future research.

3.1 Insights from the discussion

As discussed earlier, one can distinguish between the a) curriculum approach and the b) individual learning approach; between objectives and outcomes. Within the former the focus is on the objectives in the educational program (what should be taught and how), while the latter focuses on the measurement of what the individual student should have learned during education as prescribed intentions. The latter approach can also be said to have developed further into the c) institutional effectiveness discussion, where defined learning outcomes are used as measures of performance on the institutional level, and use this as a tool in the allocation of funding (Prøitz 2011:122-123).

Within this distinction it is also a separation between different levels of analyses. In a) and c), the focus is on institutions and their performance, while in b) the focus is on individual measurements. This difference is important when trying to find potential measurements of learning outcomes.
Karlsen (2011:17) argues that the definition used by the countries participating in the Bologna Process,

*Learning outcomes describe what a learner is expected to know, understand and be able to demonstrate after successful completion of a process of learning*

is an agreed upon definition of learning outcomes. This includes the institutional level (the formulated expectations of the student) as well as the individual level (the ability to demonstrate). The emphasis on both the institutional level and the individual level indicates that measures of learning outcomes should strive to include both levels.

### 3.2 Generic versus specific skills

Another important discussion is whether to focus on measurement of generic skills or discipline oriented skills. Generic skills can be described as transferable skills – the part of the individual outcome that can be transferred between different employers. One of the goals of higher education is to prepare students for their future work, which is often described as shifting and dynamic (Karlsen 2011:19). In addition to prepare those students enrolled in vocation oriented study programs with the specific skills necessary, it is important to provide students with skills that can be relevant in a multitude of jobs. Profession or occupation specific skills and outcomes must be defined in accordance with the demands from the future work, and the educational program is oriented towards this. Generic skills are less specific, as they should be relevant for a multitude of jobs. In StudData[^3], a Norwegian longitudinal survey following students from different education programs, a question measuring generic skills is for instance whether the educational program have promoted their “ability to critical reflect upon and evaluate their own work”. All students have been asked if their education have promoted this. An example of an occupation specific skill can be taken from a part of the survey designed especially for medicine and doctors: Newly educated doctors have been asked whether their internship has provided them with the skills necessary for “inserting a subrapubic catheter”. The distinction between the two types of skills is not crystal clear, however. For doctors inserting a subrapubic catheter can be seen as a profession specific skill that every doctor must know. But this also means that the skill should be transferable and in this way generic. This is even clearer if another example is taken from the StudData-survey: “ability to relate to relatives of small children”. Is this a profession specific skill for doctors or a generic skill for all health professionals? The boundaries are blurry.

Whether one wishes to focus on generic or specific skills has implications for what kind of data that should be used for measuring learning outcomes. Specific skills are often measured using grades. Generic skills are more often measured using tests or self-administered surveys. An international

[^3]: [http://www.hio.no/content/view/full/10591](http://www.hio.no/content/view/full/10591) (14/12-2011)
example of a test measuring generic skills is the CLA – Collegiate Learning Assessment. CLA is a written test where the students access an online web-form. They are asked to evaluate an overall problem, as well as different documents of uncertain reliability. Following this they are to answer a written test by critically discuss and reflect upon the different statements in the different documents (Opheim and Aamodt, 2010). This procedure is included in the AHELO (Assessment of Higher Education Learning Outcomes) feasibility study, carried out by the OECD. The aim is to produce comparative data between educational institutions and countries. Norway participates in the feasibility study.

Arum and Roksa (2011) has used the CLA in a comparison of American higher education institutions. He argues that one of the strengths of the CLA is that it is not based on the students own reports, but on their actual use of generic skills. This is in contrasts to other tests such as e.g. the NSSE (National Survey of Student Engagement). The NSSE is developed in order to measure whether higher education institutions have an effective learning environment, and contributes to active engagement from the students. Using meticulously tested and validated instruments five benchmarks have been developed: Level of academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences and supportive campus environment. Learning outcome is measured as “gains in personal and social development”, “gains in general education” and “gains in practical competence” (Zhao and Kuh, 2004:10). NSSE has inspired Norwegian research on learning outcomes as well. The previously mentioned StudData-project has included scales measuring gains in practical competence.

The measuring of gains in competence is central in the discussion of learning outcomes. Outcome from education implies change from the first measurement or observation to subsequent observations or measurements. This holds true irrespective of theoretical stance: In a behavioural perspective measurements of changed performance from time 1 (T1) to time 2 (T2) is in focus, after manipulating the environmental influences and reinforcing desired behavior. Gains are equal to desired change. In a cognitive perspective focus has been on e.g. increased problem solving skills and development of problem solving strategies from T1 to T2. In a socio-cultural perspective learning takes place as a “transformation of knowing” (Wenger 1998:139), driven by participation in social practices (but is also understood as participation in itself). This focus on change and gains points to important methodological issues concerning validity and reliability, which will be discussed in the next section. The main question is: how can we measure change in a reliable way?

3.3 Methodological aspects measuring learning outcomes

Whether one measures learning outcomes using grades or self-administered surveys, questions concerning validity and reliability are of utmost importance. Validity concerns the accuracy of the measure used, reliability whether the same test will produce the same results under same or similar
conditions. When interested in measuring outcome from education, one needs to account for how much change is caused by the education, and how much change would have happened anyway. Strictly speaking, this implies comparing students who are “exposed” to education to education to students who are not. This is not a straight forward comparison, however.

Caspersen, Lødding and Wiborg (2011: 92-93) sum up specific methodological problems regarding measurement of learning and effect of education. The “gold standard” for measuring effects can be found in RCT (Randomized controlled trial). In a RCT design, participants are randomly allocated to a treatment group and a control group. This makes it possible to compare those who are exposed to the treatment in question to those who are not. In the case of education, this would imply allocating youth randomly to higher education and compare them to those who are not entering higher education. With random allocation students and non-students would statistically speaking be identical. But the decision to enter higher education has by many been shown to be far from a random process, and is related to e.g. race, ethnicity, gender and social background (Bottero 2005: 5). This directs the attention to the importance of knowing what students bring with them into education in order to know what they take out. Information is included about their performance level in the areas one wishes to measure outcome, in addition to information about their background. By measuring performance on T1 a “benchmark” for later measurements is established. Together with information about the students’ “input” on T1, it is possible to specify what the contribution from education is, the “value added”, or gain.

An adjacent challenge to this problem of selection is the problem of endogeneity. This refers to the development that takes place within the individual regardless of what situation the individual experiences. To put it differently, endogeneity refers to the individual development that would have taken place from T1 to T2 regardless of participation in educational program. The use of control group design makes it possible to isolate this effect. It should be noted that this kind of endogeneity-problem also exists at the institutional level. How would an institution develop regardless of any measures taken in order to improve performance? What part of the development is related to external influences and what part mirrors a general institutional development? This also points to the problems of measuring outcomes of educational reforms that is aimed towards increasing learning outcome. If a change is observed after the implementation of a reform, how can it be certified what part of the change is caused by the reform and what part would have changed anyway? (This of course implies that a benchmark is created before implementation). The answer is the use of control groups.

Karlsen (2011: 85-86) sums up six methodological and empirical challenges that need to be addressed in future research on measuring learning outcomes. The argument is based on her review of previous empirical studies in the field, and general methodological discussions.
First of all, previous studies have used a broad variety of measures on outcome. The result is that there is little knowledge about whether different types of operationalizations measure the same phenomenon. For instance, do grades, often assumed to measure profession specific skills, correlate with measures on generic skills such as used in e.g. StudData?

Second, there is a need for research including grades or specific learning outcome as well as generic learning outcome, and at the same time distinguishing between different professions and educational tracks. This is necessary in order to understand whether and how generic skills are included in the grading in different subjects. It is also important in order to develop a theoretical approach to learning outcome in higher education that includes the variety of different disciplines and professions and their traditions. Furthermore, specific and generic skills are not easily distinguishable. What is considered specific skills in one educational program might be considered generic skills in another program. This has consequences for how we evaluate learning outcome across different disciplines and programs. Karlsen also adds that the conceptualization of what generic skills actually include is weak. In the research literature generic skills comprises the opening of a word-document on a computer to the ability to get an overview of a large amount of information quickly. Do generic skills imply simple, practical skills, or more personal characteristics?

Third, longitudinal designs are important in order to measure the “value added” in higher education. Ideally, one should include students and non-students in the design, or at least the use of control groups in one way or another. It is important to include grades from previous education in order to ensure comparability. However, when using longitudinal design including the same individuals at several points in time (panel design), an important issue, that is not easily handled, is panel attrition and the corresponding selection of respondents. Who drops out of the study, and who chooses to participate? Is this process random or not?

Fourth, the reliability of different measuring instruments such as the CLA and NSSE should be tested across different educational programs and countries. If the instruments are intended to evaluate the quality of educational programs, it is essential that the instrument itself do not benefit institutions or programs with a specific organization. If so, it could lead to a loss of legitimacy.

Fifth, more research on the correlation between objective and subjective measurements of learning outcomes is needed. Subjective measurements refer to self-evaluation of outcome and are often used in cross-sectional surveys. In StudData, outcome is measured using a general question: “How large is the outcome of your education in the following areas (profession specific skills, practical skills, values and attitudes, personal abilities).” But do questions of this kind measure the same type of learning outcome as the “objective” measures included in the CLA?

Finally, research is needed in order to specify what students use as a comparison when answering questions concerning subjective outcome. Do they compare with other students’ outcome? Do they
compare with their own starting point? Do they compare with their own expectations at the beginning of their education?

As shown, the list of methodological and empirical issues concerning the measurement of learning outcomes is long. Future research should take these challenges into account when planning their design. In the final section, a brief discussion of some relevant existing Norwegian data sources and their current potential are discussed. These are ongoing projects that can adapt the insights summed up so far in future rounds.

3.4 Relevant existing Norwegian data sources and their potential

Although it was argued in section 3.0 that there is less research examining learning outcomes in higher education in Norway than in other educational levels, several data sources exist. Not all are directed solely towards measurement of learning outcome, but instead they have learning outcome included along with other variables. Each of the sources has different strengths and weaknesses, and these will be discussed in the following. All sources are presented in table 1, as well as their orientation, strengths and weaknesses.

The Learning condition monitor is oriented towards measuring participation in lifelong learning activities after graduation. Through survey data collected as part of the Labour Force Survey (organized by Statistics Norway), participation in further education, informal training and courses and learning intensive work is measured for the Norwegian labour force (Wiborg, Sandven and Skule 2011). These dimensions are seen as related to educational level and type (profession vs. general education). In this manner, it can be seen as distinguishing between generic and specific orientation, but does not include generic and specific learning outcome as such. It is rather seen as independent variables included in order to predict other dependent variables. Background variables such as gender and age are included.

StudData is a longitudinal panel survey with three different panels, and is administered by the Center for the Study of Professions (CSP). It includes more than twenty different educational tracks, all of which are vocationally oriented professions; in three different panels (a fourth is being prepared). The students answer questionnaires at the start of their education, at the end, three years after graduation and six years after graduation. Mostly, questions concerning generic skills are included, but in panels and phases also specific skills. However, these are rarely longitudinal. Panel attrition is an important problem, as the response rate drops significantly after graduation. The panel retention rate is then sometimes very low (around 20 %). Panel attrition studies have been conducted (Storøy 2010). Self-reported grades are included, as well as family background. Established measurements are rarely used, but questions are similar to the NSSE (presented in section 3.2.). Questions concerning study strategy are included.
The NIFU Graduate Survey is administered by NIFU, and since 1972 NIFU has done follow-up surveys of higher education graduates. The Graduate Survey looks into main activity, unemployment, difficulties in finding suitable work, salary trends, etc, and includes information on student background. Spring semester graduates in selected groups included in the survey receive a questionnaire six months after graduation. Traditionally the response rate has been high, but later years it has dropped. Every second year a special survey is conducted, where graduates in different phases of the career are examined (four years after graduation, eight years after), or special groups such as those studying abroad. Questions concerning study strategy are included together with questions targeting the relevant competencies acquired through the study program.

Database for Statistics on Higher Education (DBH) is a data warehouse which holds data on a broad range of topics in the sector of higher education and research in Norway. This includes data about students and PhD candidates, their grades, their applications, their enrollment and completion of their study program. All data are at the institutional level, i.e. educational program. The institutions provide data from their registers to the data warehouse, and the data are accessible online.

NUDB\(^4\) comprises all individually based statistics on education – from completed lower secondary education to tertiary education This includes grades and diplomas on individuals. NUDB includes individually based statistics on education since 1970. Several other registers are used for different purposes. In order to improve comparability over time, a thoroughly revision of all source files, registers and classification variables has been made. Information about Norwegian students abroad has been added from 1986 onward. The database also includes demographical information.

FS is a national system for administrative data on students and educational programs. Administrative staff at the institutions provides information on all aspects of the students’ academic track, from application to enrolment, all exams and courses, grades and graduation.

Ahelo “(Assessment of Higher Education Learning Outcomes) will test what students in higher education know and can do upon graduation. More than a ranking, AHELO is a direct evaluation of student performance. It will provide data on the relevance and quality of teaching and learning in higher education. The test aims to be global and valid across diverse cultures, languages and different types of institutions” (OECD website)\(^5\). The AHELO-project is based upon the CLA (Collegiate Learning Assessment) presented in section 3.2. AHELO is currently being tested in a feasibility study, in order to test the possibilities of using CLA across countries and institutions. Norway participates in this (administered by NIFU). The focus is on measuring generic skills.

As indicated in table 1, all data sources have their strengths and weaknesses. Only a few measure skills directly with established instruments. Several of the sources are based on self-reports, and only

\(^5\) http://www.oecd.org/document/22/0,3746,en_2649_35961291_40624662_1_1_1_1,00.html, (16/12-2011)
few of the sources are longitudinal. StudData, which has a longitudinal panel study using at least partially established measures, is hampered by panel attrition. The register based sources, with fewer problems concerning attrition and response rates, only include generic skills (grades and certification).

With this perspective, it seems as the best way forward in terms of quality of measurement is to combine information from different sources. By for instance combining FS, StudData and NUDB, it is possible to compare generic skills and specific skills, and battle the challenges presented in the previous section. However, the development of reliable and valid measures must also be an ongoing process. Only by trying to combine available information in the best possible way, while simultaneously trying to improve the methods used, is it possible to contribute to the measurement of learning outcomes.
Table 2. Different existing Norwegian data sources, their type, orientation, strengths and weaknesses

<table>
<thead>
<tr>
<th>Data name(abbreviation)</th>
<th>Organised by</th>
<th>Type</th>
<th>Learning outcomes</th>
<th>Generic or specific skills (if relevant)</th>
<th>Data structure and coverage</th>
<th>Particular (dis)advantages</th>
<th>Level of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning conditions monitor (LVM)</td>
<td>Statistics Norway, prepared by FAFO, Institute for labour and social research</td>
<td>Survey</td>
<td>Participation in “life-long learning” activities or not</td>
<td>Partially panel data (weak). 2003-current, minus 2007</td>
<td>Not much information on learning outcomes, more on participation in learning activities. Self-report</td>
<td>Individual</td>
<td></td>
</tr>
<tr>
<td>StudData</td>
<td>Center for the study of professions, Oslo and Akershus University College of applied sciences</td>
<td>Survey</td>
<td>Self-administered. Self-evaluated learning, self-reported grades</td>
<td>Generic, except for some specific adaptations for a few selected groups, mostly cross sectional.</td>
<td>Panel data. 2005-current</td>
<td>Attrition, changing measurements and sample selections. Self-report</td>
<td>Individual, institutional</td>
</tr>
<tr>
<td>The NIFU Graduate Survey</td>
<td>NIFU. Nordic institute for studies in innovation, research and education</td>
<td>Survey</td>
<td>Self-evaluated learning outcome, grades</td>
<td>Generic,</td>
<td>Cross sectional. 1972 - current</td>
<td>Self-report</td>
<td>Individual, institutional</td>
</tr>
<tr>
<td>Database for statistics on higher education (DBH)</td>
<td>NSD. Norwegian social science data services</td>
<td>Register</td>
<td>Grades, enrolled, graduated and failed candidates</td>
<td>Specific (grades)</td>
<td>Cross Sectional</td>
<td>Only institutional level, not possible to analyse individual outcome.</td>
<td>Institutional</td>
</tr>
<tr>
<td>Database (NUDB)</td>
<td>Register</td>
<td>Grades, field of subject, learning institution</td>
<td>Specific (grades)</td>
<td>Panel data, 1970-current</td>
<td>Individual micro-data, No particular attrition-problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>----------</td>
<td>-----------------------------------------------</td>
<td>------------------</td>
<td>-------------------------</td>
<td>--------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Education Database (NUDB)</td>
<td>Statistics Norway</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felles studentsystem (FS)</td>
<td>Developed at the Section for Administrative Data Processing, University Centre for Information Technology Services at the University of Oslo, all institutions participate with information on their students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment of higher education learning outcome (AHELO)</td>
<td>OECD. Organisation for economic co-operation and development</td>
<td>Survey/self-administered test</td>
<td>Test results</td>
<td>Generic skills</td>
<td>Cross sectional, feasibility study conducted in 2011-2012 – results not yet available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4 The promise of applying learning theories when researching learning outcomes

This report has investigated possible links between the concept of learning outcome and different theories of learning, and in so doing has tried to explore the possible theoretical foundations surrounding the learning outcomes concept. While several current research projects investigate the methodological challenges surrounding the learning outcome concept (see e.g. Karlsen 2011, Opheim & Aamodt 2010), our approach has been to provide a further link to theory and a stronger analytical conceptualization of the concept. In these closing reflections, we argue for the promise of this approach for supporting further studies of learning outcomes. Based on the discussion included in this report, four main arguments can be identified that support the use of learning theories as a way of improving our understanding and application of learning outcomes.

First, learning theories are needed to provide better explanations of why certain learning outcomes appear. While much emphasis with respect to learning outcomes has been put on the link between learning outcomes and labour market relevance, we would underline another dimension behind the idea of learning outcomes: the link between learning outcomes and the processes that have led to these outcomes. By having a strong focus on learning outcomes alone will – given that some of the methodological challenges are solved - provide us with some answers as to the nature of the outcomes, while we would still have few explanations as to what caused any specific learning outcome. If the concept of learning outcome is to have relevance for higher education institutions, we need to strengthen our knowledge of the relationship between study program design, learning activities and learning outcomes. In this report we have suggested that possible ways forward include analysis of curriculum design and encompassing broader learning environments. Learning theories are, in this respect, highly relevant as tools which could be helpful in developing a coherent architecture that can provide a link between the (often) individualist focus on learning outcomes and the institutional frameworks structuring the learning experience.

Second, both learning theories and learning outcomes have an interest in measuring gains in competence and, as underlined earlier in this report, this interest is present irrespective of any particular theoretical perspective. However, such longitudinal perspectives on learning could be argued to be particularly relevant for learning theories that emphasize processes. While there seems to be a growing agreement about the need for more longitudinal studies measuring learning outcomes (see e.g. Karlsen 2011) this does not imply that designing such studies is an easy and straightforward affair. Here, learning theories would be of great assistance, not least in offering a way to identify indicators which could be used to measure possible “gains”. As such learning theories can be very useful with respect to the methodological challenges when researching learning outcomes.
Third, our discussion has clarified the need to better understand that learning outcomes perspectives contain a continuum of outcomes, in which both closed and open ended outcomes should be taken into account, if we are to acquire a comprehensive understanding of the concept. Learning theories and their different foci would also be of relevance here, due to the diversity of approaches they would support in searching for relevant types of data, not least with respect to cognitive and socio-cultural dimensions of learning outcomes. Combining various learning theories could perhaps provide us with conceptions of learning outcomes that could challenge the dichotomy between closed and open-ended outcomes. In an era where innovation and creativity are highlighted as keys to the social and economic prosperity of our societies, we should perhaps also – as indicated in figure 3 - search for more “emergent” learning outcomes, and not just reproduce the existing ones (see e.g., Buss 2008).

Finally, we would maintain that theories of learning provide us with key insights needed for developing more sophisticated research designs for capturing such generic attributes; progress in this area will inevitably be needed if interest is sustained in finding ways of measuring generic skills and competencies developed through higher education. Given the fact that study programs in higher education are highly diverse and multifaceted when it comes to their purpose, structures and relations to the labour market (society at large), one could argue that we need research designs that provide an overarching theoretical framework, to enable comparisons between various disciplines and knowledge areas.

Our final reflection concerns the data available for analyzing learning outcomes. As our overview of the different data sources related to Norwegian higher education illustrates, there are several interesting types of data available for studying learning outcomes. However, the majority of these data sources have not been designed with a particular theoretical approach in mind, and all have several weaknesses with respect to their validity and reliability. The lack of longitudinal designs in most of these data sources is striking, and where such longitudinal elements can be found, other problems are apparent, such as a dramatic reduction in response rates over time. We would argue that the most likely source of solutions to this challenge is to be found within higher education institutions. Currently, the FS system is mainly a administrative system in which institutions track and manage their study programs and the study progression of students. However, if the FS system could be expanded to include information about the design, activities and evaluation of study programs, this would create a unique opportunity for more sophisticated studies. Since the FS system is common across Norwegian higher education, and is followed up closely by the administration of the institutions, there is a strong possibility that data quality would be increased as a consequence of such an approach. Given the fact that much of the national data sources that exists are funded through the Ministry of Education, there is also a possibility for integrating different data sources, which would create possibilities for triangulation, and perhaps even quasi-interventionist studies based on these data. Given the interest concerning learning outcomes in Norway, there appears to be a need for, and interest in, both more theoretical advancements and empirical integration.
Literature


