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To cite this article: Jorunn Spord Borgen & Finn R. Hjordemaal (2017) From general transfer to deep learning as argument for practical aesthetic school subjects?, Nordic Journal of Studies in Educational Policy, 3:3, 218-229, DOI: [10.1080/20020317.2017.1352439](https://doi.org/10.1080/20020317.2017.1352439)

To link to this article: <https://doi.org/10.1080/20020317.2017.1352439>



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Published online: 08 Aug 2017.



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## From general transfer to deep learning as argument for practical aesthetic school subjects?

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### ABSTRACT

This article investigates the empirical ground for transfer thinking about the practical aesthetic school subjects (PAS). We investigate the conceptual framework and methodological possibilities and constraints concerning transfer from the PAS to other domains, and analyse the transfer arguments in arts and crafts and physical education (PE) within the context of the Nordic countries specifically. We find that there is not much research about how educational objectives, content, and teaching and working methods, assessment forms, learning processes and learning outcomes are linked together. Accordingly, the transfer from one school subject to other subjects or domains is challenging to justify. We outline an alternative perspective on transfer in PAS in general, and in arts and crafts and PE specifically that could be investigated more carefully to further the development of a more robust knowledge field.

### ARTICLE HISTORY

Received 22 December 2016  
Accepted 26 June 2017

### KEYWORDS

Arts and crafts; physical education; metacognition; causal methodology; didactics

### Introduction

The practical aesthetic school subjects (PAS) in compulsory education are most often argued intentionally and positive expectations for individuals and for societal development are high spot. Assertions about the role of these school subjects for the capacity to improve academic performance, as well as moral development, health and psychological wellbeing from a lifelong perspective, are central in the promotion of PAS in education internationally, and in the Nordic countries (Borgen, 2008; Johansson & Porko-Hudd, 2007; Òlafsson & Thorsteinsson, 2009; Reid, 1998; Trondman, 1998). These claims are about transfer from PAS to other domains; thus, data available to prove these assertions are scarce. Politicians and other stakeholders have refrained from stringent demands for accountability of PAS, and there is little research-based knowledge about how these school subjects are constituted and realised in pedagogical practice, student experiences, and assessment and learning outcomes. In general, transfer in educational contexts seems to refer to a rather diffuse understanding of learning processes and outcomes. Later, we investigate the transfer arguments and possible learning and development that can take place in the PAS, arts and crafts and physical education (PE). Finland and Norway, as well as the other Nordic countries, are currently undergoing national curriculum reforms, and the PAS, especially arts and crafts and PE, are still considered to be of importance in compulsory education. New concepts, such as self-regulative learning, metacognition and deep learning,

are highlighted (NOU 8:2015; OBS, 2016). This is the context for this study.

The most common PAS in the Nordic countries are arts and crafts (and visual arts), PE (and health), music, and home economics (and consumer studies). Most common in the Nordic countries is that the subjects have no standard examination and teachers assign final grades to their own students. In addition, few attempts have been made to assess the significance of these subjects on individual and societal outcomes, both nationally and internationally (Hovland & Söderberg, 2005). Furthermore, the subjects are not included in the OECD Programme for International Student Assessment (PISA) surveys or in empirical research that have examined school performance and learning outcomes. These PAS in Nordic schools are positioned in the discourse on education as both crucial to, and fundamentally different from, other school subjects (Borgen, 2008; Prøitz & Borgen, 2010), and are expected to impart a specific type of knowledge.

In this article, we investigate the transfer argument in PAS in general, and in arts and crafts and PE specifically. Arts and crafts and PE are traditionally the largest (in terms of teaching hours) PAS in Nordic countries' curricula (Annerstedt & Larsson, 2010; Bull-Hansen, 1953; Illeris, 2002; Johansson, 2002; Kjosavik, 1998). These subjects are rooted in vocational skills – e.g. woodwork, textiles – and the common concept for craft is *sloyd*, and in Sámi language *duodji* (Brønne, 2009; Dunfjeld, 2001; Òlafsson

& Thorsteinsson, 2009). While the term ‘crafts’ has negative connotations in relation to art in Anglo-American contexts (Garber, 2002, p. 134), positive connotations are embedded in the concept in the Nordic countries (Lindfors, 1999; Ólafsson & Thorsteinsson, 2009). Together with crafts in different materials, such as wood, ceramics, textiles and metal, are drawing, design, architecture and art history subject matters in contemporary arts and crafts subject syllabuses in the Nordic countries. While arts and crafts is one school subject in Norway (*kunst og håndverk*), visual arts and crafts are two separate subjects in Denmark, Finland, Iceland and Sweden. In this article, we will use *arts and crafts* to refer to these subjects.

PE is traditionally influenced by sports; thus, outdoor education, dance, health and bodily experience learning are also subject matters in PE subject syllabuses in the Nordic countries. PE is an internationally common subject name, while in Denmark the subject is called sport and movement (*idræt og bevægelse*); in Norway, PE and sport (*kroppøving og idrettsfag*); in Sweden, sport and health (*idrott och hälsa*); and in Finland, PE (*liikunta*).

Arts and crafts and PE have in common a well-established history of being part of a *Bildung* tradition (Borgen, 1995; Dewey, 1916; Hjordemaal, 1996; Kerschensteiner, 1931). From the Nordic perspective, as well as internationally, the progressive educational movement emphasised student activity and learning by doing well in line with the activity-oriented embodied perspectives characteristic of these subjects (Gurholt & Jenssen, 2007). Lately, there has been an increasingly stronger focus on transfer as a justification for PAS in the Nordic educational context (Espeland, Allern, Carlsen, & Kalsnes, 2011). Any school subject will always represent multiple, sometimes conflicting and/or contradictory, ideas about its core values and knowledge, and how ‘ability’ is constituted therein (Evans & Davies, 2006, Gulliksen & Hjordemaal, 2014). There are similarities in how these subjects are debated and positioned in educational discourses, usually involving concepts such as aesthetic(s), activity and bodily experience (Annerstedt & Larsson, 2010; Gee, 2004; Gulliksen, 2016; Halvorsen, 2007; Johansson, 2002; Lindfors, 1999; Lindström, 2012; Standal, 2015; Whitehead, 2001). However, this debate does not say much about how these concepts are experienced and become meaningful by students in practice. The conceptualization is rather vague, and the knowledge base of the subjects is unclear; thus, the subjects have an ambivalent position in schools.

Related to the transfer argument that the PAS help to strengthen learning outcomes in school in general, is the argument that this is especially the case for those who have difficulty with the theoretical aspects

of school (Bachmann & Haug, 2006; Bamford, 2006). The reason given is that these subjects open up the possibility of more and varied forms of learning. Amplification of these arguments arose with reference to scores in the Nordic countries’ PISA tests (Kjærnsli, Lie, Olsen, & Roe, 2007), the multinational comparative study of mathematical, scientific and reading skills of 15-year-old students. The PISA reports revealed mediocre performance for Norwegian 15-year-old students, and signs of panic spread among school politicians. Practical aesthetic school subjects are presented as a solution to the distress (Bamford, 2006, 2011). This illustrates how the transfer argument from PAS to the remaining school subjects and other domains can impact the general education debate. Characteristic of Nordic education policy is positive expectations about the PAS’ influence on the overall physical and mental health from a lifelong perspective, as well as on the development of cognitive skills and learning. This article investigates transfer thinking about the PAS in the Nordic countries, both within PAS in general, and in arts and crafts and PE specifically.

### Research questions

First, we investigate the conceptual framework and methodological possibilities and constraints concerning transfer from the PAS to other domains. Second, we analyse the transfer arguments in PAS in general, and in arts and crafts and PE specifically. Third, we outline an alternative perspective on transfer in PAS in general, and in arts and crafts and PE specifically.

Within the framework we have at our disposal, we cannot go as deep into all these issues as we would like, and will therefore only indicatively sketch potentials in relation to the third question.

### Conceptual framework, methodological possibilities and constraints

Although the transfer argument has been widely recognised and referred to in relation to the PAS in general and to arts and crafts and PE subjects specifically, the relationship between referred empirical ground and transfer as a result or consequence of learning seems to be vague in these subject areas.

The transfer domain is a disputed theoretical position, as well as being methodologically complicated (Hetland & Winner, 2004; Shadish, Cook, & Campbell, 2002; Winner, Goldstein, & Vincent-Lancrin, 2013; Winner et al., 2013). In the following, we elaborate the problems we face when we try to find research-based arguments for transfer. Even though there is much work to be done when it comes to the development of strong theories within the transfer domain, there are nonetheless various

definitions of what transfer is (Lobato, 2006, 2012). Lobato (2012) differentiated between mainstream cognitive perspectives and actor-oriented perspectives. In our article, we focus on the former type, because we consider these to be strongly in accordance with what is often associated with the transfer concept, especially in PAS contexts. Later, we outline another perspective based on a more actor-oriented way of thinking about transfer. There are many variants of cognitive perspectives, but according to Nokes (2009) they all characterise transfer as ‘how knowledge acquired from one task or situation can be applied to a different one’ (p. 2). A basically equal vision of transfer is manifested in a classical definition proposed by Detterman (1993), as ‘the degree to which a behavior will be repeated in a new situation’ (p. 4).

By means of some examples, we will illustrate some consequences of Detterman’s approach to the transfer concept. If a child has been taught how to ride a bike, there will probably be a very high degree of transfer if we give him another bike, or even if we observe him riding his bike in different places on different occasions. Or, if you have learned how to make a cup in arts and crafts, you will probably be able to do that reasonably well in other contexts as well. Again, there are reasons to expect a high degree of transfer. In both cases, it therefore seems sensible to conclude that what was done previously had an impact on what you were able to do afterwards. As the reader will have noticed, we are above talking about learning activities that are rather easy to define and assess in the sense that we can observe the extent to which transfer really took place because of some previous learning. However, if we choose to find out more about, for instance, the impact of visual arts on creativity in problem solving in mathematics, or the impact of dancing on reading skills, we face much more diffuse and complex discussions. These topics are but two of many that we could have presented to illustrate a well-documented and prevailing interest in whether learning activities in the PAS have an impact on activities and learning outcomes in other subjects (Bailey, 2005; Winner et al., 2013).

### **Validity and the problem of transfer in the PAS**

A main problem seems to be whether it is possible to justify that transfer actually has taken place at all. As stated above, the transfer perspective states that there is an impact or a causal relationship between something that has taken place in the PAS (often technically referred to as a treatment) and some change in the non-PAS (referred to as the outcome). In the following, we clarify and discuss the main problem of transfer in PAS based on the well-established validity typology developed by Shadish et al. (2002) during

recent decades. The typology operates with four types of validity. Statistical conclusion validity is the validity of inferences about correlation (covariation) between treatment (A) and outcome (B). Internal validity is the validity of inferences about whether an observed correlation between A and B reflects a causal relationship from A to B as those variables were measured (or manipulated). Construct validity is the validity of inferences about the higher-order constructs that represent sampling particulars. Finally, external validity is the validity of inferences about whether the cause–effect relationship holds over variations in persons, settings, treatment variables and measurement variables (p. 38).

A closer look at the definitions of the different types of validity reveals that all of them refer to validity as the validity of inferences. Thus, validity has nothing to do with the methods used (e.g. qualitative or quantitative methodologies), but rather pertains to the extent to which it is possible to justify the assertions made about what is found out (cf. also Kleven, 2008), and accordingly the capability of the research to give valid answers to the research questions. In striving to justify assertions and rule out other explanations, the researcher has to rely considerably on the strength of his or her arguments to confirm that explanations are unlikely or irrelevant. Nevertheless, the validity of causal inferences will also be heavily dependent on the research designs being used.

There are significant differences between randomised experiments, quasi-experiments and non-experimental designs as to the extent to which they are able to help justify causal inferences. In general, it can be said that the use of control groups and randomization is the best way to provide research-based support for claims that a causal relation exists. Shadish et al. (2002) drew an important difference between causal descriptions and causal explanations in the sense that it is one thing to say that a causal relationship exists, but is quite different to explain why it exists. They summed up the status of experimental research in social sciences in the following way: ‘What experiments do best is to improve causal descriptions; they do less well at explaining causal relationships’ (p. 12). However, even if the researcher has been able to justify beyond reasonable doubt that he or she has found a causal relationship of interest, this result is very often most local and particularistic. It is also important to know whether it is possible to generalise the causal relationship to other persons and contexts. Let us, for instance, say that a researcher conducted a study on fifth-grade students in a primary school in Germany in 2012, with 20 pupils in a class, well-educated teachers, and so on, and that the researcher measured the effect on the non-PAS subjects while the students were still in

school – rather than six months or one year later. In addition, even if the results showed that there was a significant average difference between students who received the treatment compared with those who did not, the results refer to a difference at the group level – we cannot say much about individual effects. Thus, what worked well for one child had no effect or even turned out negatively for another. When it comes to concept validity, it is for instance crucial to know how the researcher defined creativity in the research (creativity being a higher-order, rather abstract concept) and how this was operationalised or measured in terms of what the students should do (e.g. what tasks they should perform) in order to make it possible to decide whether they are creative.

We use the validity system of Shadish et al. (2002) to try and shed some light on why it seems to be so difficult to find research justifying that transfer actually has taken place in instructional settings. Our discussion is of general relevance, but as such is also relevant for our understanding of problems we often have to face when conducting research within the PAS. As pointed out above, there are several ‘threats’ to the different types of validity that must be overcome in order to give research-based support for claims about transfer of learning. Accordingly, it will nearly always be possible to find good reasons to discuss the extent to which we have found the transfer of learning we have been looking for.

In our discussion above, we point out that the use of control groups and randomization is the best way to give research-based support for claims that a causal relation exists between studying PAS and observed improvements in non-PAS learning activities. Therefore, it seems advisable to conduct more studies based on a randomised experiment design (cf. for instance Winner et al., 2013). We support this view, but find it important to underline once again some important aspects that such designs do not necessarily do better than others. In our opinion, these aspects are often forgotten, or at least undercommunicated, when the benefits of such designs are discussed in the social sciences. This could also have been more underlined when Winner et al. (2013) discussed methodological improvements for further research (p. 10 f.)

First, construct and external validity will not improve just because we turn, for instance, a quasi-experimental design into a randomised experiment design. Only internal validity often improves, because many of the threats to internal validity are now better taken care of. Second, we find the distinction between causal descriptions and causal explanations essential. Although it is important to find research-based support that there is a causal relationship between two factors, such knowledge is often of limited interest and rather unusable if we

are not able to say something significant about why and how the cause led to the effect. We are not saying that such knowledge could not, to a certain extent, be achieved by more advanced randomised experiment designs, but the why and how questions are often difficult to answer without the use of qualitative approaches as well, helping us to understand how things are perceived from the perspectives of actors involved in the transfer of learning. Maxwell (2004) also supported a stronger focus on causal explanations via the application of qualitative approaches in social sciences. He stated that this will help us in recognizing ‘the possibility of identifying causality in particular cases, the importance of context as integral to causal processes, and the role of meaning and interpretive understanding in causal explanation – all issues for which qualitative research offers particular strengths’ (p. 8). In the following publication analysis, we examine the publications in the PAS area in the Nordic context. For this purpose, we use the criteria obtained from the methodology specified earlier: concept validity, external validity, and internal validity.

### **The transfer argument in PAS and arts and crafts and PE**

We analysed a selection of publications on PAS in general, and arts and crafts and PE subjects specifically, in Nordic countries. During the selection process, it turned out to be important to include publications on supportive cultural programmes and physical activity programmes in schools in Nordic countries.

### **Empirical data and selection of publications**

This study selected publications from the last 10 years from the online digital platform the Educational Resources Information Center, and the research platform ISI Web of Science. Defined by ‘review articles’ and ‘education and educational research’, the following search queries were used: *practical aesthetic* and *school subject*, *practical aesthetic* and *transfer*, *arts and crafts* and *school subject*, *arts and crafts* and *transfer*, *physical education* and *transfer*. A manual search was conducted by reading abstracts. The search term *practical aesthetic* and *school subject* resulted in seven articles, among which were three with Nordic authors, and one discussing the PAS. The search term *practical aesthetic* and *transfer* yielded 15 articles, none of which were within the PAS area. The search term *arts and crafts* and *school subject* resulted in 18 articles, four of which were by Nordic authors, while the search term *arts and crafts* and *transfer* gave three articles. The search term *physical education* and *transfer* resulted in 115



articles, one of which was by an author from a Nordic country. These searches were conducted between May and August 2016.

A manual search of publications in Nordic languages yielded more results. Publications in this field seem to be dominated by national discourses, and therefore were most often found by searching for the name of the subject in school in the national language, via Nordic countries' official educational policy websites, Nordic journals, websites for researcher networks and teachers unions, and so on. In addition, we searched for review articles in the subject fields. When transfer was mentioned, we went further to look at the specific references. Transfer has been discussed in the articles as part of the motivation for the study, as hypotheses about possible positive influence on behaviour and choices in future life, and as findings in terms of potential transfer. The publications analysed were a selection of review articles, PhD- and master's theses, and articles in established journals, as well as common grey literature, e.g. articles and reports, policy documents for education, evaluations and reports.

Given that these PAS represent a large and complex field of knowledge, and with different traditions in the subjects in each Nordic country, there are limitations to the publication analysis in terms of generalizability.

### **Practical aesthetic school subjects and transfer**

The PAS are considered of importance to Nordic societies, and are expected to support various objectives, such as social equality, integration and inclusion (e.g. Borhagen & Lind, 2002; Kulturministeriet 2011; Nordic Council of Ministers 2008; Norwegian Ministries, 2005; Report No. 8 [2007–2008] to the Storting; Knowledge Promotion Reform 2006; NOU, 2015; Riksidrottsförbundet, 2009). However, it is unclear whether students' work tasks in these subjects promote the acquisition of such outcomes (Borgen & Vibe, 2009; Johansson, 2006; Moser, 2004). It seems that the positive expectations from the PAS are not strong enough to oppose the idea that schooling leads to social reproduction. Factors such as the parents' educational background and the child's gender and cultural background play a decisive role in the results achieved by the child (Cale & Harris, 2011; Evans & Davies, 2006; Fini, 2008; Flintoff, 2008; Markussen, Frøseth, Lødding, & Sandberg, 2008; Markussen, Lødding, Sandberg, & Vibe, 2006; Støren, Helland, & Grøgaard, 2007; Yu, Chana, Cheng, Sung, & Haua, 2006). This is in line with the internationally observed 'advocacy rhetoric' and general claims (Gee, 2004, p. 115) of the benefit of transfer from the PAS to other domains, characterised by 'hard-driven marketing', and the fact that

no distinction is made between purpose and capabilities with regard to learning outcomes for the students (Gee, 2004). A possible consequence is a loosely connected subject area in school.

The PAS syllabuses are strongly embedded in the national curriculum goals, content, expected outcome and a distinct position in educational policy in Nordic countries. Although there is no common theoretical framework for these subjects, and each one has its own tradition, theoretical background and teaching practices (Hovland & Söderberg, 2005, p. 2), they are highly valued by many pupils.

Aesthetics and aesthetic experience are key concepts in the PAS, and concepts related to value and judgement, skill, expression or experience in most subject syllabuses. However, Thorgersen and Alerby (2005) found no clear definition of aesthetic(s) in the Swedish core curriculum from 1994. While PAS are strongly associated with aesthetic experiences and aesthetic theory (Illeris, 2002), it is unclear what this means for teaching and learning in the subjects. What makes the PAS more tangible and recognizable is the practical and bodily elements of the subjects (cf above).

Variations in teachers' competence (Espeland et al., 2011), teaching and assessment practices, and the role for PAS as 'supportive' as opposed to 'core' subjects (Prøitz & Borgen, 2010) might result in low status in Norwegian schools (Oltedal, Gamlem, Kleivenes, Ryslett, & Vasset, 2015). Oltedal et al. (2015) found that PAS 'are among the non-core subjects receiving highest grades in Norwegian lower secondary schools, but also represent the highest number of complaints about grading' (p. 1). This may reflect the fact that students have only limited access to and understanding of the learning objectives in these subjects (Leirhaug, MacPhail, & Annerstedt, 2016). The same ambivalence is reflected in a study of the implementation of the 2006 Knowledge Promotion Reform in sixth grade in Norwegian schools (Holthe, Hallås, Styve, & Vindenes, 2013). School owners, principals and teachers agree on the general positive outcome of these subjects for students, and for transfer to other domains. However, the PAS have not been included in the outcome-based result-management system following the 2006 Reform. Administrative, economic, pedagogical, organizational and cultural frame factors (Møller, Ottesen, & Herzberg, 2010) seem to be in favour of math, science, reading and writing (first-language subjects). In spite of high expectations for the PAS in general education, we observe that these expectations are not present either in student experiences of these subjects in everyday school practice, or in how teachers experience the frame factors and their consequences. While the PAS are considered of high importance in educational policy, they seem to be in

an ambivalent position in everyday school practice, and weakened under the 2006 Reform.

### **Arts and crafts and transfer**

Arts and crafts publications seem to be oriented towards historical studies, and towards new international concepts such as ‘design’ and ‘making’; thus, the dominant topic is exploration and documentation of ‘practical aesthetic working methods’, which seems to be a common Nordic term in this subject field. While the importance of practical aesthetic working methods in schools for the quality of learning is highlighted and strongly advocated for, it is difficult to grasp what is actually meant by this concept within arts and crafts.

A report on the role of PAS in Norwegian schools referred to a variety of international research to establish an argument for transfer from the PAS and practical aesthetic working methods to other subjects. In a survey among 750 PAS teachers in Norwegian schools, the teachers expressed positive expectations for practical aesthetic working methods and were supportive of transfer arguments (Espeland et al., 2013). The two statements ‘Good quality in the practical and aesthetic subjects at school help students perform better in the other school subjects’ (p. 13), and ‘Working methods of the practical and aesthetic subjects are important to achieve good results in other school subjects’ (p. 13) were strongly supported by the teachers. However, the same teachers used these working methods infrequently in other subjects. In the report, this was partly explained by a lack of teacher competence, frame factors, etc. This study also asked the teachers to identify their ‘practice theory’ within four constructs (p. 86). For the ‘arts and *Bildung*’ construct, the teachers referred to an understanding of the practical creative side of arts and crafts as activity without the knowledge or skills, and therefore with lower demands on the teachers’ material technical knowledge and skills (Espeland et al., 2013, p. 92). Practical aesthetic working methods seem to be a more frequent activity within the arts and crafts subject, and thus has low expectations in terms of learning outcome.

According to an overview of arts and crafts PhD theses in Nordic countries<sup>1</sup> and a Norwegian review of master’s theses (Melbye, 2002), practical aesthetic working methods and pedagogical/didactic studies seem to be the most dominant research interests in this field. Exploring working methods and materials in a personal and independent way is the main quality indicator for research at master’s level (Melbye,

2002). Halvorsen (2002, p. 52) suggested that researchers who produce empirical material through the practical aesthetic working methodology will have the opportunity to get inside of processes that provide an existential experience of the didactic issues at stake. This could form the starting point for classroom research.

Compared to other academic subject fields, research in the arts and crafts field is a young phenomenon and not easily available (Borg & Erixon, 2006), due to its interdisciplinary characteristics. In a study of the *sloyd* classroom in Swedish comprehensive school, students reported that they enjoyed the daily activities; however, how and what students do and learn while working in the *sloyd* classroom is still to a large extent hidden and unexpressed, and more research is needed (Johansson, 2006). The lack of systematic research-based knowledge will threaten the legitimacy of the subject in school: ‘The fact that the subject’s knowledge qualities are not generally known is a problem that needs to be bridged before *sloyd* as a subject can become an important resource in the school’s work as a whole’ (Johansson, 2006, p. 169).

The practical aesthetic working methods seem to be dominant knowledge interests in the subject field. Classroom studies, content studies, studies on student experiences, and formative and summative assessment and students’ role and students’ learning outcomes are rare (Lutnæs, 2011). The research in arts and crafts seems to have prioritised a process-oriented environment for students, and implicit expectations of transfer to other domains. Arts and crafts knowledge production seems to be substantially focused on individual processes, and there is a manifold of subthemes, mostly related to didactic reflection.

Emphasis on practical aesthetic working methods support a tradition of not documenting cultural projects in school carried out in such a way that they can be the object of analysis and reflection (Thavenius, 2005). This critique of the emphasis on the processes as means in themselves in the PAS, including arts and crafts, as well as other subjects, is also a demand for clarity and concern for the learner. If the impact is to become more than activities in school, it is therefore necessary to reconcile the production with reception and reflection for all students, according to Thavenius (2005). Cultural projects and PAS should include the sensual and emotional aspects of learning, as well as meta-learning about, among other things, what knowledge is, who we are and what place we have in society (Thavenius, 2005, pp. 16–17).

Overall, in accordance with the transfer advocacy rhetoric (Gee, 2004; Winner et al., 2013), research ambitions in this knowledge field seem rather to be to confirm existing assumptions than explore currently

unknown issues. These knowledge interests in the field might reflect a strained relationship between policy formation, knowledge in the teacher profession, teaching practices and research.

### **Physical education and transfer**

PE research is oriented towards a general international discourse and, more frequently than in the arts and crafts knowledge field, we find publications by Nordic researchers in English. The PE knowledge field is particularly concerned about challenges in teaching and curriculum development and critical sociocultural theories. We found studies of gender/sex, ethnicity, class, and social inclusion/exclusion approaches (Annerstedt & Larsson, 2010; Dowling Næss, 1998; Larson & Redelius, 2008). Thus, physical activity and health seem to have become increasingly important in the field. However, the ambivalent position for the PAS in school is also manifest in the PE subject in Nordic countries.

Humanistic *Bildung* and health from a lifelong perspective in the PE could easily become opposing interests in the subject syllabuses in Nordic countries. In Denmark, the aim of PE has changed from humanistic *Bildung* towards a more science-based foundation, and health has become increasingly important (Von Seelen, 2013). This implies that tests are more common as part of teaching and assessment in the subject, and 'being fit' seems to be associated with the prospects of lifelong health. In Norway, humanistic *Bildung* through movement experiences is a central aim, and tests should not be part of assessment in the subject (Leirhaug et al., 2016). However, arguments about transfer from PE today and the impact from a lifelong perspective are common.

In a Swedish project, researchers videotaped several PE lessons in school in order to learn more about the challenges of teaching and learning. The research group consisted of scholars in Sweden. Exploring learning in PE is possible but complex, and according to these researchers this has been a challenge in the field of research (Quennerstedt et al., 2014, p. 283). Further, they claimed that 'In PE research, the focus has often been on the content (curriculum) and the teaching of the subject (...), where learning theories sometimes have the tentative function of providing guidance for curriculum development, curriculum models or teaching strategies.'

A review of research on PE in Norway based on a systematization of reports, PhD and master's theses, and articles published in Norway and abroad by Norwegian authors from 1978 to 2010, found that there were few studies about what students experience and learn in PE (Jonaskås, 2010). The field has

been dominated by research for 'problem solving'; for instance, a substantial amount of the research has been oriented towards special education. Another main research topic is teacher competence, teaching, and evaluation of curriculum models, and has confirmed the picture of a research field focused on teaching, learning theories and methodology referred to by Swedish researchers (Annerstedt & Larsson, 2010; Quennerstedt et al., 2014). Thus, there are few studies on student experiences, formative and summative assessment, student role, and learning outcomes (Leirhaug et al., 2016).

International review articles on PE (Bailey, 2005, 2006; Bailey et al., 2009) have referred to similar paradoxes as Winner et al. (2013) discussed concerning arts education. Bailey (2006) noted that policy rhetoric is often confused with scientific evidence on transfer. As transfer arguments go between teachers, theorists and policymakers, '(T)he tone in the debate might lead one to assume that the different advocates are drawing upon a substantial body of empirical data.' In a review of the relationship between PE, sport and social inclusion, Bailey (2005) suggested that

(...) there are some areas for which there is a considerable amount of evidence in favour of a positive relationship with participation in these activities (such as physical and mental health), and others for which further research remains necessary (such as cognitive and academic development, crime reduction, truancy and disaffection). In general, however, it is evident that much more empirical research is necessary if the benefits of sporting participation for young people and society are to become much more than a theoretical aspiration. (p. 71)

A review of PE in Finnish schools (Yli-Piipari, 2014) concluded that while it has been well documented that PE is well regarded among Finnish elementary and middle school students Yli-Piipari (2014),

(...) the evidence of the effectiveness of Finnish PE programs on students' cognitive, social, and psychomotor development is scarce. Whereas numerous research efforts have been conducted and reported on PA, motor skills, and fitness, studies specifically examining the role of school or PE in children's and adolescents' physiological outcomes have been sparse. In addition, there are no studies examining the explicit relationships between school PE and student social-cognitive outcomes. (p. 477)

While the advocacy rhetoric in policy reports and documents seems clear and unambiguous regarding transfer, more emphasis in the scientific discourse in PE has been placed on the uncertainties regarding evidence of transfer from PE to other domains.



## Findings

A similar picture for arts and crafts as for PE is that there have been few reports on how students learn, and what they actually learn in these subject fields. Moreover, there has been little research about how educational objectives, content, and teaching and working methods, as well as assessment forms, are studied as such, or research where learning processes and learning outcomes are linked together. The characteristic differences we find between the two subject areas seems to be that the arts and crafts subject field is oriented towards studying the practical aesthetic working processes, while the PE subject field is more oriented towards studying PE and its role in school and in relation to broader society.

We examined the quality of the studies included in the selected publications based on the validity system of Shadish et al. (2002). We found that the *concept validity* is weak and the relationships between concepts are undecided and not accounted for. It is a common feature in the selected publications that how the arts and crafts and PE subject fields relate to more theoretically founded concepts are often not unveiled or debated. It is rarely taken up for discussion what purposes specific elements should promote. The purposes are referred to more generally and are related to the transfer argument, as if this relation is taken for granted. For instance, practical aesthetic working methods are well described as action. There seem to be no limits to what the term 'practical aesthetic working methods' can accommodate; nevertheless, there are few descriptions of what characterises these working methods. Moreover, while there is expected to be a relationship between PE in school and lifelong movement activity, few if any studies shed light on this association.

*External validity* is often problematic because the contexts have no framing. Instead of carefully describing the context and identifying the boundaries of, respectively, arts and crafts and PE to other domains (cf. 'thick description' [Geertz 1973]), the contexts are inadequately drawn up. When the context for certain practices and experiences is vaguely described, it is difficult to identify when we are in the context and when we are outside of it. Diffuse boundaries lead to fuzzy reasoning and one can easily go straight to the conclusion without distinguishing between what can be generalised and what cannot.

*Internal validity* is weak because it is often unclear what kind of research design is used in the studies. The methodological questions are often superficially discussed and explained. The research often seems to have a weak theoretical base, and is ideologically justified by ambiguous research concepts. Is the foundation correlation studies, quasi-experiments or randomised experiments? Who are the selected

informants, and who selected them, why and how? Accordingly, the research does not meet Shadish et al.'s (2002) criteria for internal validity, and, based on these criteria, it is difficult to decide whether transfer has taken place, and to what extent.

Based on our research findings, it seems reasonable to conclude that practical aesthetic working methods are conceptually challenging, and with weak internal and external validity. PE and lifelong movement activity seem to be challenging concepts as well. Thus, it is difficult to justify claims about transfer, and accordingly supply policy makers with research-based knowledge about transfer from PAS to other domains. In the concluding section of our article, we outline another way of looking at transfer in PAS based on impulses from an actor-oriented perspective, phenomenology, metacognition and self-regulated learning.

## Outline of an alternative perspective on transfer in the PAS

As we have stated above, we need more knowledge on transfer of learning in general, and specifically from the PAS. In much of the research conducted so far the perspective of the learner, and what happens in the school context, has often been neglected. Such an actor-oriented perspective on transfer was also supported by Lobato (2012) (cf. above). Based on research mainly in mathematics and physics education, Lobato claimed that this perspective is particularly well suited to help us understand three aspects of transfer. The first is how students describe and interpret transfer situations. If research on transfer is exclusively conducted from the point of view of the observer, it is his or her understanding of transfer that counts as a basis for statements on whether transfer has occurred, what has been transferred, and how and why it took place. Second, such a perspective will make it easier to understand how the actor interacts with other students and teachers, different material resources, normed practices, etc., when transfer processes in classrooms are being studied. Third, an actor-oriented perspective is better suited to examine how the actor during the transfer process constructs his or her knowledge based on his or her goals, expectations and preconceptions. Thus, the building of knowledge is considered as an active structuring process, as opposed to a more mainstream view of transfer (cf. above) that transfer of knowledge is something (a structure, way of thinking, behaviour) that is 'carried over' from one context or domain to another.

We find the actor-oriented perspective on transfer well suited to integrate with a phenomenological

approach to research. This approach has often been used in research in arts and crafts in Norway, as well as in other Nordic countries (Guttorm, 2015; Halvorsen, 2007). To a somewhat lesser degree, this is also the case in PE (Standal, 2015). Thus, there are research traditions in PAS to build on if we want to develop an alternative approach to research on transfer. The phenomenological first-person point of view (Gallagher, 2012), in terms of how the individuals perceive, interpret and reflect upon their bodily and practice-related experiences, has a major position in many learning processes in the PAS (cf. above). Based on our findings, and our general experiences as researchers and lecturers within these domains, the concepts for how to conceptualise and reflect upon such experiences have thus far been sparsely developed.

As emphasised above, the research on transfer of learning from the PAS subject area to other domains is complicated, and the results so far are not that promising. It seems to us that transfer could be possible if there is explicit instruction towards the specific qualities of the learned tasks, combined with cognitive and motivational processes, eventually described in self-regulation and metacognitive theories (Dunlosky & Metcalfe, 2009; Flavell, 1979; Zimmerman, 2008). Concepts and procedures for helping the learner to describe and to reflect upon his or her own learning processes have been strongly emphasised in research on metacognition and self-regulation. Flavell (1979, p. 906), for example, roughly described metacognition as ‘thinking about thinking’. In learning processes we use metacognition to reflect upon how we learn and, based on what we find out, how we can adjust and improve our own learning or learning strategies – often referred to as metacognitive regulations (Brown, 1987). According to Pintrich (2000, p. 453) self-regulated learning (is) ‘an active, constructive process whereby learners set goals for their learning, and then attempt to monitor, regulate and control their cognition, motivation and behavior, guided and constrained by their goals and the contextual features in their environment’. As can be seen, the learner is considered an important and active part in his or her own learning. He or she is capable of setting realistic goals, and to examine thoughts, emotions and behaviour in such a manner that there is a reasonable probability of success.

Transfer, deep learning, metacognition and self-regulative learning theoretical concepts act together in policy formation and implementation within the Nordic educational context. This is also an important aspect of the PAS subject area discourse, and it is specifically interesting to recognise how transfer is strongly emphasised as a possible result of the deep learning approach (Ohlsson, 2011; Pellegrino & Hilton, 2012). We will further investigate these

theories so as to better understand from a first-person point of view the significance of the PAS and transfer.

## Note

1. For more information, see Nordiskt forum för Forskning och Utvecklingsarbete inom utbildning i slöyd (NordFO): <http://www.nordfo.org/en>.

## Acknowledgements

The authors have contributed equally to the article.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Funding

This work was supported by the Norwegian School of Sport Sciences.

## References

- Annerstedt, C., & Larsson, S. (2010). ‘I have my own picture of what the demands are...’ Grading in Swedish PEH – problems of validity, comparability and fairness. *European Physical Education Review*, 16(2), 97–115. doi:10.1177/1356336X10381299
- Bachmann, K. E., & Haug, P. (2006). *Forskning om tilpasset opplæring*. Volda: Høgskulen i.
- Bailey, R. (2005). Evaluating the relationship between physical education, sport and social inclusion. *Educational Review*, 57(1), 71–90. doi:10.1080/0013191042000274196
- Bailey, R. (2006, October). Physical education and sport in schools: A review of benefits and outcomes. *Journal of School Health*, 76(8dÓ), 397–401. American School Health Association. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1746-1561.2006.00132.x/epdf>
- Bailey, R., Armour, K., Kirk, D., Jess, M., Pickup, I., & Sandford, R.; BERA Physical Education and Sport Pedagogy Special Interest Group. (2009). The educational benefits claimed for physical education and school sport: An academic review. *Research Papers in Education*, 24(1), 1–27. doi:10.1080/02671520701809817
- Bamford, A. (2006). *The wow-factor. Global research compendium on the impact of the arts in education*. Berlin: Waxmann.
- Bamford, A. (2011). *Arts and cultural education in Norway*. Bodø: Nasjonalt senter for kunst og kultur i opplæringen. Retrieved from [http://www.kulturskoleradet.no/upload/bruker/dokumenter/Dokumentarkiv/10\\_Forskning/2012\\_Arts\\_and\\_Cultural\\_Education\\_in\\_Norway.pdf](http://www.kulturskoleradet.no/upload/bruker/dokumenter/Dokumentarkiv/10_Forskning/2012_Arts_and_Cultural_Education_in_Norway.pdf)
- Borg, K., & Erixon, P.-O. (Eds.). (2006). *Sloyd – Tradition in transition. Tidsskrift för lärarutbildning och forskning (Journal of Research in Teacher Education)*, 2–3, 7–9.
- Borgen, J. S. (2008). Extraordinary or inevitable? Evaluating The Cultural Rucksack (TCR), a new arts and cultural programmes in primary and lower secondary schools in Norway. In *The OECD symposium*

- 'Evaluating the Impact of Arts & Cultural Education on Children and Young People'. Oslo: Musikk i skolen.
- Borgen, J. S. (1995). Formingsfaget i et oppdrags- og dannelsesperspektiv. In I. B. Thronshart (Ed.), *Formingsfagets egenart: En artikkel- og essaysamling*. Notodden: Høgskolen i Telemark/Telemarkforskning.
- Borgen, J. S., & Vibe, N. (2009). Musikkfaget i opplæringen. Om intensjoner og resultater, og litt om utfordringene for faget. In *Musikk i skolen 1/09*. Oslo: Musikk i skolen.
- Borhagen, K., & Lind, U. (2002). *Perspektiv på kultur för lust och lärande*. Stockholm: Skolverket.
- Brønne, K. (2009). *Mellom ord og handling. Om verdsettning i kunst og handverksfaget* (Vol. PHD thesis 41). Oslo: Arkitektur- og designhøgskolen i Oslo.
- Brown, A. L. (1987). Metacognition, executive control, self-regulation, and other more mysterious mechanisms. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65–116). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bull-Hansen, R. (1953). *Tegning på naturlig grunnlag: Forming som middel i oppdragelse og opplæring fra småbarn til voksen*. Oslo: Fabritius.
- Cale, L., & Harris, J. (2011). 'Every child (of every size) matters' in physical education! Physical education's role in childhood obesity. *Sport, Education and Society*, 18(4), 433–452. doi:10.1080/13573322.2011.601734
- Detterman D.K. (1993). The case for the prosecution: Transfer as an epiphenomenon. In D.K. Detterman & R.J. Sternberg (Eds.), *Transfer on trial: Intelligence, cognition, and instruction* (pp. 1–24). Norwood, NJ: Ablex.
- Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York: Macmillan. Retrieved May 4, 2016, from [via Internet Archi](http://www.internet.archi)
- Dowling Næss, F. (1998). *Tales of Norwegian physical education teachers: A life history analysis* (PhD Thesis). Oslo: Norwegian School of Sport Sciences.
- Dunfjeld, M. (2001). *Tjaalehtjimmie - Form og innhold i sørsamisk ornamentikk*. Avhandling for dr.art.-graden. Tromsø: Universitetet i Tromsø.
- Dunlosky, J., & Metcalfe, J. (2009). *Metacognition*. Thousand Oaks, CA: Sage Publications.
- Espeland, M., Allern, T.-H., Carlsen, K., & Kalsnes, S. (2011). *Praktiske og estetiske fag og lærerutdanning*. En utredning fra en arbeidsgruppe nedsatt av Kunnskapsdepartementet høsten 2010, i samarbeid med høgskolene i Nesna, Telemark og Stord/Haugesund. Stord: HSH-rapport 2011/1.
- Espeland, M., Arnesen, T. E., Grønsdal, I. A., Holthe, A., Sømoe, K., Wergedahl, H., & Aadland, H. (2013). *Skolefagsundersøkelsen 2011 Praktiske og estetiske fag på barneteget i norsk grunnskule*. Stord: HSH-rapport 2013/7.
- Evans, J., & Davies, B. (2006). Social class and physical education. In D. Kirk, D. Macdonald, & M. O'Sullivan (Eds.), *The Handbook of Physical Education*. London: Sage Publications.
- Fini, R. (red.). (2008). *The future of learning and teaching*. Venice: Formazione insegnamento. Rivista quadrimestrale de Ricerca, Documentazione e Critica. Organo Ufficiale della SSIS del Veneto. Anno VI, Numero 1 /2, 2008.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906–911. doi:10.1037/0003-066X.34.10.906
- Flintoff, A. (2008). *Black and minority ethnic trainees' experiences of physical education initial teacher training*. Loughborough: Report to the Training and Development agency, Carnegie Research Institute, Leeds Metropolitan University.
- Gallagher, S. (2012). *Phenomenology*. New York: Palgrave Macmillan.
- Garber, E. (2002). Craft education in Finland: Definitions, rationales and the future. *Journal of Art & Design Education*, 21(2), 132–145. doi:10.1111/1468-5949.00308
- Gee, C. B. (2004). Spirit, mind and body: Arts education the redeemer. In E. Eisner & M. L. Day (Eds.), *Handbook of research and policy in art education* (pp. 115–134). New Jersey: NAEA.
- Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.
- Gulliksen, M. S. (2016). Embodied Making, Creative Cognition and Memory Drawing on neurobiological knowledge of creative cognition and the role of the hippocampus in memory storage and recollection to explore the experience of carving green wood. *FORMakademisk*, 9(1), 1–19.
- Gulliksen, M. S., & Hjordemaal, F. R. (2014). Choosing content and methods: Focus group interviews with faculty teachers in Norwegian pre-service Subject teacher education in design, art and crafts. *Scandinavian Journal of Educational Research*. Published Online 3. November 2014. doi:10.1080/00313831.2014.967809
- Gurholt, K. P., & Jenssen, R. (2007). Reformpedagogikkens innpass i kroppsøvingfaget. *Norsk Pedagogisk Tidsskrift* Årg. 91, 447–459.
- Guttorm, G. (2015). Contemporary Duodji – a personal experience in understanding traditions. In T. Jokela & G. Coutts (Eds.), *Relate North. Art, heritage and identity* (pp. 60–77). Stockholm: Swedish University Publisher.
- Halvorsen, E. M. (2007). *Kunstfaglig og pedagogisk FOU. Nærhet, distanse, dokumentasjon*. Kristiansand: Høyskoleforlaget.
- Halvorsen, E. M. (2002). Fagdidaktisk forskning med utgangspunkt i kulturarv. In E. Melbye (Ed.), *2002: Hovedfagsstudium i forming 25 år* (pp. 47–60). Notodden: Avdeling for estetiske fag, folkekultur og lærerutdanning, Institutt for forming og formgivning, HiT skrift 2/2002.
- Hetland, L., & Winner, E. (2004). Cognitive transfer from arts education to nonarts outcomes: Research evidence and policy implications. In E. Eisner & D. Day (Eds.), *Handbook of research and policy in art education* (pp. 135–161). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Hjordemaal, F. R. (1996). *Verdiforhold i familien: En undersøkelse basert på Eduard Sprangers kultur- og oppdragslære*. Doktorgradsavhandling, Pedagogisk forskningsinstitutt, Universitetet i Oslo. Norwegian University Publisher.
- Holthe, A., Hallås, O., Styve, E. T., & Vindenes, N. (2013). Rammefaktorenes betydning for tilrettelegging av opplæringen i de praktisk-estetiske fagene – en casestudie. *Acta Didactica Norge*, 7(1), 1–19. Article no. 13.
- Hovland, G., & Söderberg, S. (2005, September 7–10). *Evaluating the practical and artistic school subjects in Sweden and Norway*. Paper presented at the European Conference on Educational Research, University College Dublin. Retrieved from [www.leeds.ac.uk/educol/documents/143546.doc](http://www.leeds.ac.uk/educol/documents/143546.doc)
- Illeris, H. (red.). (2002). *Studies in visual arts education*. København: The Danish University of Education.



- Johansson, M. (2002). *Sløydpraktik I skolan - hand, tanke, kommunikation och andra medierande redskap*. (In Swedish, with an English summary: Craft and design in school – hand, mind, communication and other mediating tools). Göteborg: Göteborg Universitet, Göteborg Studies in Educational Sciences 183, ph.d.avhandling.
- Johansson, M. (2006). The work in the classroom for sloyd. Borg, K., Erixon, P.-O. (eds) (2006). *Sloyd – Tradition in transition. Tidsskrift för lärarutbildning och forskning (Journal of Research in Teacher Education)*, 2-3, 153–169.
- Johansson, M., & Porko-Hudd, M. (2007). Introduction – Knowledge qualities within the field of sloyd. In M. Johansson & M. Porko-Hudd (Eds.), *Knowledge, qualities and sloyd. (Techne series: Research in Sloyd Education and Crafts Science A9/2007)* (pp. 5–8). Vasa: Nordic Forum for Research and Development in Craft and Design.
- Jonskås, K. (2010). *En kunnskapsoversikt over FOU arbeid innen kroppsøvningsfaget i Norge fra Januar 1978-Desember 2010*. Oslo: Seksjon for Kroppsøving og Pedagogikk, NIH.
- Kerschensteiner, G. (1931). *Theorie der Bildung (Theory of education)*. Leipzig: B.G. Teubner.
- Kjærnsli, M., Lie, S., Olsen, R. V., & Roe, A. (2007). *Tid for tunge løft. Norske elevers kompetanse i naturfag, lesing og matematikk i PISA 2006*. Oslo: Universitetsforlaget.
- Kjosavik, S. (1998). *Fra ferdighetsfag til forming: Utviklingen fra tegning, sløyd og håndarbeid til forming sett i et læreplanhistorisk perspektiv* (Ph.d. thesis). Oslo: Det utdanningsvitenskapelige fakultet, Universitetet i Oslo.
- Kleven, T. A. (2008). Validity and validation in qualitative and quantitative research. *Nordisk Pedagogikk*, 2008(3), 219–233.
- Kulturministeriets Udvalg for Idrætsforskning. (2011). *Fysisk aktivitet og læring – en konsensuskonferanse*. København: Kunststyrelsen. Retrieved from [http://idrætifolkeskolen.dk/uf/30000\\_39999/38790/3791ca2d0671e588e16ae1a29ea216cc.pdf](http://idrætifolkeskolen.dk/uf/30000_39999/38790/3791ca2d0671e588e16ae1a29ea216cc.pdf)
- Larson, H., & Redelius, K. (2008). Swedish physical education research questioned – Current situation and future directions. *Physical Education and Sport Pedagogy*, 13(4), 381–398. Swedish physical education research. doi:10.1080/17408980802353354
- Leirhaug, P. E., MacPhail, A., & Annerstedt, C. (2016). 'The grade alone provides no learning'; investigating assessment literacy among Norwegian physical education teachers. *Asia-Pacific Journal of Health, Sport and Physical Education*, 7(1), 21–36. doi:10.1080/18377122.2016.1145429
- Lindfors, L. (1999). Sloyd education in the cultural struggle. Part VIII. In *An outline of a sloyd educational theory*. Vasa: Åbo Akademi University, Faculty of Education, Report no. 4/1999.
- Lindström, L. (2012, June). Aesthetic learning about, in, with and through the arts: A curriculum study. *The International Journal of Art & Design Education*, 31(2), 166–179. doi:10.1111/j.1476-8070.2012.01737.x
- Lobato, J. (2006). Alternative perspectives on the transfer of learning: History, issues, and challenges for future research. *The Journal of the Learning Sciences*, 15(4), 431–449. doi:10.1207/s15327809jls1504\_1
- Lobato, J. (2012). The actor-oriented transfer perspective and its contributions to educational research and practice. *Educational Psychologist*, 47(3), 232–247. doi:10.1080/00461520.2012.693353
- Lutnæs, E. (2011). *Standpunkturdering i grunnskolefaget Kunst og håndverk – læreres forhandlingsrepertoar* (Akademisk doktorgradsavhandling avgitt ved Arkitektur- og Designhøgskolen i Oslo). Oslo: AHO.
- Markussen, E., Frøseth, M. W., Lødding, B., & Sandberg, N. (2008). *Bortvalg og kompetanse*. Oslo: NIFU STEP Rapport 13/2008.
- Markussen, E., Lødding, B., Sandberg, N., & Vibe, N. (2006). *Forskjell på folk – hva gjør skolen?* Oslo: NIFU STEP Rapport 3/2006.
- Maxwell, J. (2004). Causal explanation, qualitative research, and scientific inquiry in education. *Educational Researcher*, 33(2), 3–11. Retrieved from <http://www.jstor.org/stable/3699970>
- Melbye, E. (red.). (2002). *Hovedfagsstudium i forming 25 år*. Notodden: Avdeling for estetiske fag, folkekultur og lærerutdanning Institutt for forming og formgivning, HiT skrift 2/2002.
- Møller, J., Ottesen, E., & Herzberg, F. (2010). Møtet mellom skolens profesjonsforståelse og Kunnskapsløftet som styngsreform. *Acta Didactica Norge*, 4(1), 1–23. Article no. 15.
- Moser, T. (2004). The significance of physical activity for the psychosocial domain. A crash between myths an empirical reality? In P. Jørgensen & N. Vogensen (Eds.), *What's going on in the gym? Learning, teaching and research in physical education* (pp. 50–71). Odense: University of Southern Denmark.
- Nokes, T. J. (2009). Mechanisms of knowledge transfer. *Thinking and Reasoning*, 15(1), 1–36. doi:10.1080/13546780802490186
- Nordic Council of Ministers, Copenhagen. (2008). *Education, creativity and entrepreneurship in an era of global change*. Programme for the Icelandic Presidency of the Nordic Council of Ministers 2009 in research, culture and education. Copenhagen: Nordic Council of Ministries. ANP2008:753.
- Norwegian Ministries. (2005). *Action plan for physical activity 2005–2009. Together for physical activity*. Oslo: Norwegian Ministry of Health and Care Services.
- Norwegian ministry of Culture: Report No. 8 (2007–2008) to the Storting. *Kulturell skulesekk for framtida*. Oslo: Norwegian Ministry of Culture. Retrieved from <https://www.regjeringen.no/no/dokumenter/Stmeld-nr-8-2007-2008-/id492761/>
- Norwegian ministry of education and research. (2006). *Knowledge promotion reform*. Oslo: Norwegian Ministry of Education and Research.
- NOU. (2015). *8 The School of the Future. Renewal of subjects and competences*. Oslo: Norwegian Ministry of Education and Research.
- OBS. 2016. Curriculum Reform Finland. Retrieved from [http://www.opf.fi/download/151294\\_ops2016\\_curriculum\\_reform\\_in\\_finland.pdf](http://www.opf.fi/download/151294_ops2016_curriculum_reform_in_finland.pdf)
- Ohlsson, S. (2011). *Deep learning. how the mind overrides experience*. Cambridge: Cambridge University Press.
- Ólafsson, B., & Thorsteinsson, G. (2009). Design and craft education in Iceland, pedagogical background and development: A literature review. *Design and Technology Education*, 14(2), 10–24.
- Oltedal, E., Gamlem, S. M., Kleivenes, O. M., Ryslett, K., & Vasset, T. (2015). Teachers' assessment experiences and perceptions in the practical-aesthetic subjects. *Scandinavian Journal of Educational Research*. doi:10.1080/00313831.2015.1066431
- Pellegrino, J. W., & Hilton, M. L. (Eds.). (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st century. Committee 011 defining deeper*



- learning and 21st century skills*. National Research Council of the National Academies. Washington, DC: The National Academy Press.
- Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451–502). San Diego, CA: Academic.
- Prøitz, T. S., & Borgen, J. S. (2010). Rettferdig standpunkt-vurdering – det (u)muliges kunst? *NIFU STEP report 16/2010*. Oslo: NIFU STEP.
- Quennerstedt, M., Annerstedt, C., Barker, D., Karlefors, I., Larsson, H., Redelius, K., & Öhman, M. (2014). What did they learn in school today? A method for exploring aspects of learning in physical education. *European Physical Education Review*, 20(2), 282–302. doi:10.1177/1356336X14524864
- Reid, W. A. (1998). Systems and structures or myths and fables? A cross-cultural perspective on curriculum content. In B. B. Gundem & S. Hopmann (Eds.), *Didaktik and/or curriculum. An international dialogue* (pp. 1998). New York: Peter Lang, American University Studies.
- Riksidrottsförbundet. (2009). *Varför idrott och fysisk aktivitet är viktigt för barn och ungdom* (FAKTA OCH ARGUMENT). Stockholm: Author. Retrieved from [http://www.rf.se/globalassets/riksidrottsforbundet/dokument/motionsidrott/idrott\\_viktigt\\_for\\_barn.pdf](http://www.rf.se/globalassets/riksidrottsforbundet/dokument/motionsidrott/idrott_viktigt_for_barn.pdf)
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin Company.
- Standal, Ø. F. (2015). *Phenomenology and pedagogy in physical education*. London: Routledge.
- Støren, L. A., Helland, H., & Grøgaard, J. (2007). *Og hvem stod igjen...? Sluttrapport fra prosjektet Gjennomstrømning i videregående opplæring blant elever som startet i videregående opplæring i årene 1999-2001*. Oslo: NIFU STEP rapport nr. 14/2007.
- Thavenius, J. (2005). Om den radikala estetiken. *Utbildning & Demokrati*, 14(1), 11–33.
- Thorgersen, K. A., & Alerby, E. (2005). One word to rule them? The word aesthetics in curricula for the Swedish compulsory school of today. *Utbildning & Demokrati*, 14(1), 63–79.
- Trondman, M. (1998). *Den kulturpolitiska brännpunkten – om behovet och konsten att studera kultur i skolan*. Nordisk kulturpolitisk tidsskrift 3/1998. Borås: Bibliotekshögskolan i Borås.
- Von Seelen, J. (2013). *Introduktion til forskning i idræt i folkeskolen*. Retrieved from [www.idraetifolkeskolen.dk](http://www.idraetifolkeskolen.dk)
- Whitehead, M. (2001). The concept of physical literacy. *European Journal of Physical Education*, 6(2), 127–138. doi:10.1080/1740898010060205
- Winner, E., Goldstein, T. R., & Vincent-Lancrin, S. (2013). The impact of arts education: From advocacy to evidence. In *Art for art's sake? The impact of arts education*. Centre for Educational Research and Innovation CERI. OECD Publishing. doi:10.1787/20769679
- Yli-Piipari, S. (2014). Physical education curriculum reform in Finland. *Quest*, 66(4), 468–484. doi:10.1080/00336297.2014.948688
- Yu, C. C. W., Chana, S., Cheng, F., Sung, R. Y. T., & Haua, K.-T. (2006). Are physical activity and academic performance compatible? Academic achievement, conduct, physical activity and self-esteem of Hong Kong Chinese primary school children. *Educational Studies*, 32(4), 331–341. doi:10.1080/03055690600850016
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45(1), 166–183. doi:10.3102/0002831207312909