Danish Clearinghouse for Educational Research

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The Danish Clearinghouse for Educational Research is a new unit at the School of Education, University of Aarhus established at the end of 2006. The aim of the clearinghouse is to identify good practice in education.

This concept note describes how the clearinghouse will work. It is a dynamic paper, which will be revised in the coming months and years as the staff and partners in the clearinghouse gain experience and international research within the field of evidence-based practice develops.

First the purpose of a clearinghouse is outlined (1). Then the different functions a clearinghouse can have are described (2). In (3) one of the main products of the clearinghouse is presented: the systematic review, which identifies evidence across individual studies. Then the specific procedure that will be followed in preparing the systematic reviews is described (4). Finally, the general principles of a communication and product strategy are described (5).

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The Danish Clearinghouse for Educational Research

Concept note

1. Arguments in support of a Danish Clearinghouse for Educational Research

"The correlation between Danish educational research and the use of research results must be strengthened. The recognition of this fact has spread throughout the Danish education and research community, helped along the way by the OECD assessment of Danish educational research published in October 2004".

Thus begins the memorandum "Forum for uddannelsesforskning og Clearinghouse" (lit: Forum for educational research and Clearinghouse) prepared by The Danish University of Education in cooperation with the Ministry of Science, Technology and Innovation and the Ministry of Education[1]. The memorandum formed the basis of a conference, 'An evident improvement', which was held at The Danish University of Education in March 2006, and served, together with the conference, as the starting gun for what will become the Danish Clearinghouse for Educational Research.

The memorandum from The Danish University of Education and the two ministries summarises the issues that characterise the current situation in two coherent trends:

- The growing need for reliable, informed knowledge (among politicians and practitioners)
- Increasing production and supply of knowledge (in research and development environments).

The production and diffusion of knowledge is not only increasing today; it has become complex and multidimensional, influenced by a number of factors:

- The globalisation of knowledge production means that in principle, relevant knowledge can be found all around the world and in any language.
- Research is divided into separate research fields and environments, and the individual researcher cannot be expected to have a comprehensive overview of all knowledge within even a limited area.
- Knowledge production does not only take place in formal knowledge environments such as research environments since development and practitioner environments also produce potentially relevant knowledge. This knowledge is often produced in individual networks without following the established practice with regard to criticism and publication found in research environments.

The OECD report on Danish educational research identifies the fundamental problem that there are inadequate links between the different knowledge-producing environments, i.e. the research and development environments, and the environments that are to make use of the knowledge produced, i.e. politicians and practitioners.

A *Danish Clearinghouse for Educational Research* is part of the solution to this problem. The clearinghouse will help ensure that politicians and practitioners have access to reliable, informed knowledge about upbringing, teaching and education that can be used in educational practice and policy making. In addition, the clearinghouse will help research environments gain a greater and more certain overview of existing research. This can be used to, among other things, pinpoint areas where there is a need for more research.

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[1] *Forum for uddannelsesforskning og Clearinghouse* ("Forum for educational research and Clearinghouse"), DPU, MVTU and UVM, 2006. See http://www.dpu.dk/aabenlys

2. Activities in the clearinghouse

The purpose of the clearinghouse is to provide politicians and practitioners with the current best knowledge. The best knowledge builds on the available evidence and the conclusions that can be drawn from it.

Evidence is not the same as definitive proof. Rather, evidence is the rational basis on which a decision is made on the background of the currently available information. If new or more comprehensive information becomes available later, the decision may be reformulated or rejected. The fact that a conclusion is based on evidence therefore means that it is supported by the best – most credible and relevant – knowledge available.

The clearinghouse meets this purpose by performing three functions: the clearinghouse *collects* and *analyses* information and *distributes* knowledge firmly anchored in the best evidence available. This knowledge may derive either from actual research studies or from experimental and developmental work, and it may come from both Danish and international sources. The key characteristic of the clearinghouse is that it does not conduct primary research or evaluations. Evidence is studied on the basis of the documentation produced in connection with previous research and development work.

The three functions of the clearinghouse can be further specified in six fundamental activities, which demonstrate the special role the clearinghouse plays:

- *Collecting*: the clearinghouse collects information in a systematic way. This means that information is collected on the basis of a described method that meets the demand for classification. Information is typically collected on an ad hoc basis in order to shed light on a specific question, but it may also be collected in order to build a library
- *Building a library*: the clearinghouse collects, classifies and stores information over a longer period of time in a library. In this way potential users have access to and a systematic overview of information that would otherwise be dispersed. The classification may be based on various criteria, for example, subject, method or quality. The library may contain primary studies, but several organisations, such as the *Nordic Campbell Center*, create more limited libraries of systematic reviews, both their own and those of other producers.
- *Quality assessment*: the clearinghouse assesses the quality of information and can therefore guarantee the quality. Potential users can thus invest their trust in the clearinghouse instead of having to try to assess the credibility of each individual information sender. The quality assessment must always be based on explicit criteria.
- *Extraction and collocation*: the clearinghouse extracts the key data in each individual source of information and groups them in one single document, hereby enhancing their clarity and transparency for users. *Extraction* may, for example, involve pinpointing the conclusion, writing an abstract or a summary article, creating a datasheet or adding keywords and searchwords. C*ollocation* involves gathering information from many sources into one single source, for example, by gathering the conclusions from a number of sources in a single document or a single data table. Users thus have access to one clear and focused document which gathers the conclusions to a specific question or area. The presentation may involve a greater or lesser degree of synthesis of the information gathered.
- *Synthesis*: Synthesis involves working up the individual conclusions to a general conclusion, recommendation, model or similar result across the individual studies. Potential users can thus get access to one overall conclusion based on the existing and quality assessed knowledge of a specific question or area.
- *Distribution*: the clearinghouse actively strives to disseminate relevant

information through communication to interested parties.

Each step can be seen as a potential independent product, but steps cannot be by-passed, for example, by jumping directly from collection to synthesis. However, it is possible to "step off" after each of the six steps. Continuing through all the steps to the synthesis corresponds to carrying out a so-called *systematic review*, which is the most important product from the Danish Clearinghouse for Educational Research.

3. The systematic review

Systematic reviews are developed as a method to examine evidence of the effects of specific initiatives. These may be, for example, multisystem therapy for adolescents with behavioural problems or the use of curricula in day-care centres. The main purpose is to determine whether a particular initiative, for example, a standard method, works in relation to a specific target group when specific effects are measured. The review can also be aimed at a broader search for factors that are presumed to have an effect on whether a particular initiative works, for example to identify factors of significance for successful teaching. The systematic review can also aim to find evidence of connections, that is, the mechanisms through which a specific effort leads to a specific effect.

Today, there are a large number of organisations around the world that prepare systematic reviews and other products connected with evidence basing of policies and practice. The systematic review is thus an established, and usually the main product among the organisations on a global scale that work with evidence.

The idea behind the systematic review is to examine evidence using previous primary studies as a starting point. There are several advantages to doing so. By looking at different independent studies sources of error in the study can be minimised. Evidence can be strengthened by looking across contexts to see whether the same effects can be found in different contexts. At the same time different research groups'

resources are pooled by looking across several studies of the same phenomenon.

The systematic review has its own particular rules, procedures and methods, which the Danish Clearinghouse for Educational Research will follow:

- Systematic reviews are based in principle on *all studies*, regardless of language and country of origin, which shed light on the study question. In practice, however, many organisations and researchers base their work on a representative selection of studies, because the ambition of comprehensiveness is impossible to realise in practice and efforts in this direction do not necessarily result in greater certainty for the evidence.
- Searches are made for studies according to systematic criteria, which are described in a search strategy.
- Systematic reviews contain clear guidelines on how to *select* from the large body of studies with the aim of inclusion/exclusion. Studies are included regardless of whether they support or reject a given claim.
- Systematic reviews include a synthesis of knowledge from the studies included. This involves determining what the best possible answer or answers are to the question posed.
- Systematic reviews make use of *explicit* methods and criteria that ensure *openness* throughout the process. The conclusions drawn in systematic reviews and the background for them can thus be studied and discussed by outsiders. The values and choices involved in a review should to the greatest extent possible be transparent and explicit. One element of this is keeping a record of the decisions made at all steps in the process.

Many of these stipulations derive from a wish to minimise bias. Bias may be the result of many different factors. The people who make the reviews can be a source of bias, for example, if they only look in certain types of sources or only look for stud-

ies they know and which confirm established assumptions. Bias can also be due to the nature of the databases used. A publications bias may arise because journals have a greater tendency to accept articles that show relationships than those that do not. There may also be a linguistic or geographic bias. None of these biases can be eliminated, but the clearinghouse will make a conscious effort to minimise them. All review protocols will include descriptions of what has been done to minimise bias.

Even though these general guidelines are followed by all organisations that make systematic reviews, there are also important differences between the different approaches. The most important difference is the demands made of research if its results are to be accepted as an expression of evidence.

In Denmark there are two organisations that produce systematic reviews, namely, the national units under the two international collaborators *Cochrane* and *Campbell*, which produce reviews in the fields of medicine and the social sciences respectively. The Campbell Collaboration also has limited activities within the field of education. The memorandum from The Danish University of Education, the Ministry of Science, Technology and Innovation and the Ministry of Education refers precisely to Cochrane and Campbell and in addition, to two American organisations: *What Works Clearinghouse* and *the American Institute for Research*, which, among other activities, coordinate educational research. By making these references, the memorandum indicates certain traditions within clearinghouses. Cochrane and Campbell are strong exponents of a knowledge ideal that builds on a well-defined hierarchy of research methods. The strongest method in research studies is random control trials (RCT), and in several reviews it is the only type of study that is acknowledged as evidence. Campbell furthermore claims that qualitative research does not aim to express an opinion about the effect of an initiative, but rather describes, for example, the experience of the initiative. Both organisations have worked to develop methods for systematic reviews

and for quality assessment of RCT- and quasi-random studies[2].

Other organisations that work with clearing also exist, and may give significant inspiration to a Danish clearinghouse. One example is the English *EPPI-Centre* (The Evidence for Policy and Practice Information Co-ordinating Centre) at the Institute of Education, London University. On the whole, there is a large community in Great Britain of both researchers and organisations that work with evidence. In contrast to Campbell, EPPI works with systematic reviews that include research based on different methodological approaches. In reviews from EPPI one thus finds both quantitative and qualitative studies of effect. EPPI has also worked with reviews that examine evidence for other types of questions than effect. The differences between the types of studies included in systematic reviews also have consequences for the method used to synthesise knowledge.

A fundamental decision for a clearinghouse is what methods will be used to produce systematic reviews. As a starting point, the Danish Clearinghouse for Educational Research will work with several methods that allow for the inclusion of both qualitative and quantitative studies. This is made apparent in the description below of the work procedure involved in the production of systematic reviews from the Danish Clearinghouse for Educational Research by working with different synthesis methods, among other things. This does not mean that methods become arbitrary; on the contrary, high standards must be set in terms of the reliability of the methods used.

An important task for the clearinghouse will be to contribute to an examination of the methods used, and to draw systematic conclusions from their use. This will ensure the quality development of the clearinghouse's own products and contribute to the international development of the field.

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[2] Researchers at Campbell have also worked to develop systematic methods for quality assessment of qualitative research, but this work has not produced actual methods.

4. Working process, players and the review method

There are three types of players involved in carrying out each review: the *clearinghouse* (management and secretariat), the *review group* (chair and ordinary members), and a *commissioning party* (may be the clearinghouse itself, a group of interested researchers, an interest organisation or a ministry). They all play different roles at each step of the process.

All review processes follow the nine steps listed below. Each step has its own method, which is described in advance, even though several of the steps require elaboration and adaptation in connection with the individual review. Each step is documented in a protocol, which is drawn up at the beginning of each review.

1. Creating the protocol for the review, including the first version of the review questions, a description of the search strategy, sorting criteria, data extraction and synthesis method. Staffing the project with a review chair, who participates in the creation of the protocol
2. Finding staff for the review group
3. Searching for studies
4. Screening, mapping and scoping of the studies
5. The review group assesses the results of steps 1 through 4 and any necessary adjustments are made
6. Classifying studies according to research quality
7. Extracting data from the studies
8. Synthesising the results of the studies
9. Report writing

The final content of the individual steps in the review process has not yet been determined, in part because it depends on the contents of the review and the method or methods selected in connection with the individual review, and in part, because the experiences gained in carrying out systematic reviews will be taken into consideration in future reviews.

1. Creating the protocol and staffing the project with a review chairperson
Who: the clearinghouse, the review chairperson and possibly a commissioning party

The use of a protocol is a fixed and crucial element in any systematic review regardless of other similarities or differences between methodologies. The protocol is the element that ensures and documents the openness and systematisation in the review process. There are different approaches to how detailed the protocol should be before the review is begun. For example, the ambition of the Campbell reviews is that "the protocol is so good that by following the directions, different researchers will arrive at the same result independent of one another."[3] Other researchers work with an iterative protocol, which is continuously revised.[4]

The Danish Clearinghouse for Educational Research will work with a protocol in which all key decisions, such as the search strategy, criteria for exclusion and inclusion of individual studies, quality criteria and criteria for synthesis are described. This must all be described before the review begins. Some decisions will, however, depend on the results of prior processes. For example, decisions about the synthesis method will depend on which studies the search actually identifies, and it may therefore be necessary to revise the protocol. In this case any revisions will be recorded in the protocol, along with the argumentation behind them.

Protocol design
The first version of the protocol is written by the clearinghouse in cooperation with the chairperson of the review group and possibly a commissioning party. External research expertise may also be sought for the design. Core points of the protocol are:

- The formulation of the question or questions the review is to attempt to answer and which can be empirically studied.
- Key concepts in connection with the question are defined and the effect

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[3] http://www.sfi.dk/sw29919.asp#516_2400.

[4] Pawson 2006.

being studied is placed in a theoretical/scientific context, which shows which scientific discussions the review will contribute to elucidating.

- The search strategy and synthesis method used are described. The general framework for both the search strategy and the synthesis method are described in this paper, but for each review these things will have to be specified further.
- Any focus on particular research methods or studies with special characteristics is defined and described as part of the search strategy. This might involve, for example, limiting the search to Danish studies or to studies reported in particular languages, to studies that use a specific method or to specific disciplines within educational research. The reasons for these choices are explained and the expected consequences are assessed. In some cases, random checks are subsequently carried out to assess the actual consequences.
- The criteria for the composition of the review group are described cf. item 2.

2. Staffing the project with the other members of the review group
Who: the clearinghouse (taking into consideration the wishes of the commissioning party, if any)

The protocol forms the basis for the recruitment of the members of the review group. By becoming members of the review group the researchers also accede to the protocol, including the review questions and the synthesis methods used. The group includes researchers with great expertise within the review question being studied. Moreover, efforts will be made to ensure that the review group consists of members who supplement each other, for example, because of their different methodological strengths or different approaches to the field.

3. Searching for studies
Who: the clearinghouse and the review group

The first search for relevant studies is carried out in accordance with the search strategy described in the review protocol. The search process is crucial to the carrying out of the systematic reviews, since it is the studies found that are the source of the final synthesis and assessment of evidence. The search strategy must be designed to the greatest extent possible with a view to minimise bias in the group of studies selected. The reasons for all selections or rejections must be explicitly described. Searches are typically made in databases, journal, previous reviews, grey literature and through manual searches. A special question that must be considered before the search is begun is whether only research sources are to be included in the search, or whether development work will also be included.

4. 'Screening', 'mapping' and 'scoping' of studies
Who: the clearinghouse

The first search can result in a very large number of hits. Screening, mapping and scoping involve a selection and sorting of these studies in order to create an overview. This work is carried out by the clearinghouse secretariat, and the results are subsequently presented to the review group in step 5. The first step is the screening process, where irrelevant studies are excluded. This is performed in accordance with the criteria described in the search strategy in the protocol. An important type of criteria is the object of study: is the study aimed at the type of initiative or practice being investigated, has the relevant target group been found, and are things measured according to the parameters in focus in the review? Another type of criteria is the methodological criteria: if, for example, the protocol restricts the review to one particular method, all other types of studies are excluded in this phase. The screening takes place in two steps: first, based on title and abstract, and second, based on a reading of the entire document. The screening may be performed by two

different people in two independent processes and an interrater reliability can subsequently by calculated. What is included, what is not included, and why, is recorded. The entire process is documented in the review's own database of all studies found.

The next step is mapping, where the body of selected studies is systematised. This process is conducted according to the relevance criteria described in the protocol, for example, according to the study method or the type of effect being measured, or possibly the causal model the primary studies presuppose. Then an assessment is made of whether there is relation between the criteria laid down in the protocol and the studies found, a process called 'scoping'. Corrections to the review question or the search strategy may be needed if the literature found is unsuitable for elucidating the review question. The question may be too general or too specific in relation to the literature found, or there may simply be a mismatch in relation to the focus.

5. The review group considers the results of steps 1 through 4 and makes any necessary adjustments in the protocol.
Who: The review group, the clearinghouse and possibly a commissioning party

The review group gets together and considers the results of steps 1 through 4, including the group's composition and the studies that have been included on the basis of the screening. In some cases the review group finally approves the protocol, including the review questions and possibly approves proposed changes to the review question. The group also considers whether the search strategy should be expanded. All decisions and changes are noted in the protocol.

6. The screening of studies according to research quality
Who: Review group, the clearinghouse

Each of the studies selected in step 4 is subjected to closer scrutiny with a view to screening and sorting according to research quality and relevance. This is done by the researchers in the review group with the support of the clearinghouse secretariat. The purpose of the screening process is to determine in part whether the individual study should be included in the further review process, and in part, what weight the studies included should be given in the subsequent synthesis of results.

First, the studies are sorted according to the *research method* used, since studies that make use of different methods should not be assessed according to identical quality criteria. Then a *standard questionnaire* is created for the description of all studies in the review, both those that are included and those that are excluded in this step. The questionnaire comprises a number of questions about each individual study. One type of question is aimed at *relevance*, that is, to what extent the study in question and its results are relevant in the current context. In the case of a study from abroad, for example, it may be assessed whether the conclusions are relevant in a Danish context. If the study is aimed at a broad target group, it may be assessed whether relevant conclusions can be extracted for the narrower target group of the review. Another type of question is directed at the *quality* of the study. In the case of a quantitative study, the questions raised may deal with sample size, the construction of test groups and the reporting of results. Quality assessment of qualitative studies is made on the basis of questions such as a clearly described method, how stringently the method has been followed and the quality of the report made. The specific quality criteria will be further developed in connection with the first reviews.

The screening may mean that studies originally included are excluded after step 4. The screening may also mean that studies are included in the synthesis process but with different assessments of quality and relevance. This assessment may come into play in the subsequent synthesis process, where high quality studies may be given more weight than low quality studies.

The memorandum "Forum for uddannelsesforskning og Clearinghouse" ("Forum for educational research and Clearinghouse") states that experimental and development

work can potentially also be included in the systematic reviews.[5] Experimental and development work is subject to the same quality assessment as the other studies in this phase, and the review group may include or exclude studies as described above.

7. Extracting data from studies

Who: the clearinghouse and the review group

An extraction of data from the studies that are included in the review is made. These data are reported in the standard questionnaire and are entered into the review's database of studies. They are then used as a tool in the further review process. The extraction of data makes the material easier to grasp in the subsequent review process. In order to enhance the quality of the process, different people may be allowed to perform the extraction in parallel.

8. Synthesis of the studies

Who: The review group and the clearinghouse

The synthesis gives an undistorted run-through of the answer to the review question posed. Different methods can be used to synthesise knowledge in a systematic review and thereby create new knowledge with stronger evidence than the individual studies. The clearinghouse will strive to work with several methods of synthesising:

- *Model-based synthesis*. A synthesis based on analyses of the causal logic/models found in the studies included. The synthesis will thereby produce an actual theory of dominant causal models and include an assessment of whether there is evidence within these models of expected connections between causes and effects.[6] This form of synthesis has several advantages seen from an application perspective. It sets the stage for argumentation and discussion, both internally in the re-

search community and in a dialogue on good practice between research environments and practitioner environments. The model form also paves the way for experimentation with generalisation and subsequent cross-disciplinary testing. Finally, the models may be employed as an important element in teaching, both at universities and university colleges.

- *Narrative synthesis*. A form of synthesis that summarises the conclusions of the studies included in a narrative form. Communication in continuation of these studies often consists of drawing attention to good examples as ideals to live up to, and it is therefore well suited to communication in a broader range of media and as cases in teaching.

- *Meta analysis*. A form of synthesis that consists of a statistical analysis of data from different but comparable studies. The meta analysis is reported quantitatively as a summary of results across the studies. This synthesis encourages communication of the type "the initiative works/does not work". It is therefore attention-grabbing (and makes headlines in major media). This synthesis becomes like a "black box", where it is impossible to say anything about connections.

- *Additive synthesis*. A form of synthesis where the studies included are given a numerical value based on relevance and quality. On this background the studies are "added up," and any effect is assessed based on the entire set of studies. This form of synthesis weighs scientific studies against each other, but without producing an independent product. The communication will therefore very much depend on the nature of the studies included in the synthesis.

- *Combined synthesis*. A form of synthesis based on the assumption that both qualitative and quantitative studies are included in the review and that these studies are synthesised separately. Then the syntheses

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[5] Forum for uddannelsesforskning 2006 p. 6
[6] This form of synthesis is inspired by, but not identical with, 'realistic synthesis' as developed in Pawson (2006)

are combined with the aim of drawing conclusions, for example, both about a particular effect and about the factors that influence this effect. The communication in continuation of this kind of combined synthesis will depend on what methods are used and what results emerge.

Model-based, narrative and additive synthesis is typically used if primarily qualitative studies are included in the review. Qualitative studies give the review group the greatest scope to make their own analyses and assessments of the studies included. In order to ensure that the synthesised evidence has a certain weight, it is essential that the synthesis is theoretically anchored and supported by explicit lines of reasoning and that the basis on which (and whether) it has been possible to generalise from the individual studies to a more universal form of evidence is explained. The same requirements will not necessarily be made of a quantitative meta analysis.

9. Report writing
Who: The clearinghouse and the review group

The review process leads to a written report prepared by the review group with support from the clearinghouse. The report will form the basis for a subsequent communication strategy, which is described in the following section.

5. Communication and product strategy

1. Communication
The knowledge that the clearinghouse creates through systematic reviews must be made available and pertinent to different target groups, from educational practitioners to researchers and politicians. The success criterion is not only that the messages are conveyed, but first and foremost that practitioners, researchers, and politicians put them into action in the form of changed practice or new research. This is what makes collaboration with educational practitioners and policy makers on the use of the clearinghouse's reviews important.

The specific goals for the clearinghouse's communication are:
- To ensure openness about the basis for the work and the methods and processes involved
- To ensure that the work in all phases of the review work is firmly anchored in practice
- To be differentiated in relation to different target groups
- To ensure continuous dialogue and debate about educational issues based on evidence.

Openness
The legitimacy of the clearinghouse's work depends on complete openness and transparency on the basis for the work and its methods, processes and results. This openness is ensured in among other ways by producing descriptions of the general method and by publishing protocols for each individual review, so the conclusions can be verified. An effort will be made to establish a database with, among other things, full access to both excluded and included studies and an explanation for their placement in one group or the other. However, in practice, this openness risks being restricted to trained researchers who are able to decipher the methodological choice and reproduce the searches selected. The openness must be genuine for all interested groups through more accessible journalistic communication. Each individual review thus has its own continuous communication process, through which journalistic articles are written about the background, aim and process, but which also convey differences of opinion, doubts and the need for additional research.

Anchoring in practice
In order to follow up as closely as possible on the results, the clearinghouse must maintain constant contact with key players (mainly practitioners) and include them actively in processes that run parallel to and are connected to the individual reviews. Anchoring in practice will not be restricted to after the review processes have been concluded. The clearinghouse will build a network to help identify review questions, and which can continuously consider the

products on offer. Practitioners will also be included during the review processes as a method for creating a dialogue between the knowledge accumulated by the research and the knowledge accumulated by practitioners. This process will help test the solidity of the conclusions of the review seen from a practice perspective. It can be regarded as a form of "grounding" of the results based on the assumption that verifying the correspondence (or lack thereof) between scientific evidence and experience-based evidence is in itself a way of creating knowledge. Finally, practitioners will also be brought into a discussion of suitable communication strategies and formats in connection with the individual reviews, and focus groups will be used to test the communication of results.

Target group orientation
The clearinghouse will work with different communication products adapted to different target groups in connection with the publication of the results of reviews. Different forms of communication for the same target group can also be worked with, for example, both written products and conferences, etc.

Dialogue and debate orientated
The clearinghouse will invite debate on the results of reviews in both a Danish and an international context, which implies, among other things, that the review reports (or substantial resumes) should as a rule be published in both Danish and English. It will be possible to comment on and debate reviews on the clearinghouse's website. It would be a success from both a communications and a scientific point of view if the clearinghouse were to become the centre of an academic and professional debate on education in Denmark. This would also be a significant contribution to the fulfilment of the clearinghouse's mission of promoting knowledge basing of educational practice in Denmark.

2. Types of products
The systematic research review is considered the main product type in the clearinghouse. A number of subprocesses involved in the process that leads to the systematic review can function as independent prod-

ucts, which have been described above as a chance to "step off" in the systematic review process. These sub-products do not comprise evidence in the same way as a full systematic review. Nonetheless they can be valuable to researchers, practitioners or politicians in different contexts.

a. *The systematic review*
The systematic review has already been presented above. The strength of producing systematic reviews from a Danish or Scandinavian perspective lies in part in the fact that Scandinavian primary research published in the national languages can be included. This means that forms of experience that are not represented other places are made the object of independent research.

Internationally, there is great interest in education in Scandinavia. Efforts should therefore be made to ensure that research of this type is not restricted to the Scandinavian arena but is published internationally.

b. *International systematic reviews*
Internationally reviews are already published within the field of education by the organisations described above, among others. Searching in and assessing these international systematic reviews will be one of the first phases in the production of systematic reviews from the Danish clearinghouse. This searching and assessment may also be an independent product from the Danish clearinghouse. This product will make use of the existing international knowledge of evidence, which it will be possible to communicate quickly to a Danish target group.

The international systematic reviews have the same authority as systematic reviews in general. However, in a Danish and Scandinavian context there may be a need to study whether the evidence on which the reviews mentioned are based are relevant. Such an assessment could appropriately be based on statements from qualified Scandinavian researchers.

c. *Research mapping*

In the first and third phases of the systematic reviews a search strategy is drawn up based on a given review question. If these processes are taken as an independent product, a mapping of the existing research in the field can be made. One of the reasons for mapping is to avoid duplicate studies. In addition, the actual mapping can serve to guide the research policy: by pointing out white spots in the existing research, mapping can be used as a concrete basis for the preparation of specific research strategies and thereby help ensure well-founded prioritisation of research.

d. *A research briefing*

This product is a further development of the research mapping. In the research briefing the conclusions of the studies identified in the research mapping are extracted. The content of the research briefing consists of the independent conclusions drawn in the primary studies and the assessment of the evidence made within the context of these studies. The briefing does not include the clearinghouse's own assessment of the quality of the studies and the evidence produced.

The authority of such a product type would consequently be based on the quality of the primary studies' evidence. Its authority will depend on the extent of the data summarised in the briefing and especially the quality of the studies.

e. *Research assessment*

If a domestic assessment of a given education or research policy question is needed, a panel of researchers may be called upon. The point of departure for the panel's work could be the data the more or less comprehensive research briefs are based on. Instead of letting primary researchers assess the available evidence, the panel steps in as an independent body, making independent assessments of the available evidence. The authority of such a method will be a function of the quality of the data collected and of the researchers who make the assessments.

Finally, the clearinghouse will have a number of spin-off products from the main activity:

f. *Creating a registry of Danish/Scandinavian educational research*

The precondition for a Danish clearinghouse for educational research being able to make an important contribution to Danish educational practice and policy is that Danish – and optimally Scandinavian – research is made accessible to systematic searches. Today this research is not registered in a form that allows for adequate search possibilities. The clearinghouse could be a player in the creation of registries or databases that allow for systematic searches in Danish and possibly Scandinavian educational research.

g. *Assistance with regard to expert assessments and prioritisation of research funds*

Different parts of the research community may need assistance to carry out their functions in strategically important relations more competently. Educational researchers who are asked to provide expert assistance in specific questions will need guidance in connection with search possibilities and search results. Research policy makers may need to refine research proposals before they can be converted into political recommendations. In both cases a clearinghouse will be able to provide the most qualified support.

h. *Development of practitioner-researcher networks*

The clearinghouse's function can only be considered accomplished when its research products have been communicated to researchers and practitioners. The clearinghouse will be the initiator and form the organisational basis for the creation of network groups, which may be aimed at specific projects or which may try to capture broader thematic problems cf. Section 5.1 on communication strategy.

i. *Research communication*

Communication is an important task for the clearinghouse. The challenge can be expressed in the following demands on the clearinghouse:

- Have an active agenda, where knowledge is communicated to interested parties.
- Set the agenda by helping ensure that the knowledge communicated is used where it is relevant.
- Think in terms of target groups and help contextualise the knowledge communicated so that it makes sense in the user's practice/situation.
- Develop close ties to users through a mutual exploration of how knowledge resources can be used.[7]

In this connection, an important collaborator will be university colleges.

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7 Adaptation from a contribution to the conference "En åbenlys forbedring" ("An Evident Improvement") at the Danish University of Education in March 2006 by Elaine El-Khawas, Professor in education policy at George Washington University and former Director of a ERIC Clearinghouse.

6. Background references and supplementary material

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Supplementary material

a/ Papers from the OECD's series of meetings on evidence and educational research.

Meeting in Washington, DC, USA, 2004: https://www.excelgov.org/index.php?keyword=a433923e816991&PHPSESSID=aa23070a012a04417191f7d9508cd7c0

Meeting in Stockholm, Sverige, 2005:
http://www1.lhs.se/lhskonferens/ebpr/

Meeting in the Hague, Holland, 2005:
http://www.oecd-conferences-ocw.nl/ebpr-conference/documentation.html

Meeting in London, England, 2006:
www.tlrp.org/conference/oecd/index.html

b/ Conference "An Evident Improvement" at the Dansih University of Education, 2006:
http://www.dpu.dk/aabenlys

c/ Homepages for clearinghouses and similar institutions:

http://eppi.ioe.ac.uk/EPPIWeb/home.aspx

http://km.ucalgary.ca/component/option,com_frontpage/Itemid,1/

http://www.massey.ac.nz/~nzsrda/

http://www.sfi.dk/sw22405.asp

http://www.ccl-cca.ca/CCL/Home/index.htm?Language=EN

http://www.campbellcollaboration.org/

http://www.whatworks.ed.gov/

http://calico.org/

http://www.eric.ed.gov/

http://www.air.org

http://csrclearinghouse.org

http://www.nwrel.org

http://www.ncset.org/

http://caret.iste.org/

http://www.ncrel.org/

http://www.uwex.edu/disted/home.html

http://www.edfacilities.org/

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http://www.aifs.gov.au/nch/

https://chico.nss.udel.edu/Pbl/

http://fie.engrng.pitt.edu/

http://ericec.org/

http://www.oecd.org/department/0,2688,en_2649_35845581_1_1_1_1_1,00.html