From practical issue to research question

KENNIS ROTONDE

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About this publication

This is a publication of the Knowledge Roundabout (Kennisrotonde).
The Knowledge Roundabout is an online information service in The Netherlands that uses knowledge from existing research to answer questions about education.
www.kennisrotonde.nl
The research was financed by the Programme Council for Practice-based Research of the Netherlands Initiative for Education Research (NRO).
www.nro.nl
May 2019

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From practical issue to research question

A guide for practitioners and researchers in education

IDENTIFYING ISSUES

Seek out a practical issue and examine it together like practitioners and researchers. Problems are not equally easy to detect and can present themselves from various directions.

Favourable conditions for quicker issue detection

- Within existing networks
- Innovative research behaviour
- A fresh pair of eyes (external) that provide a different perspective
- A sense of safety when proposing and assembling issues
- Encouragement to ask questions

Tips for practitioners

- Come forward with your issues, don't be shy
- Be outspoken in your contact with researchers
- Build support for your assumptions and insights

ANALYSING THE ISSUE TOGETHER

Bring perspectives and insights together in an investigative and repetitive process. Involve practitioners, researchers, end users and other stakeholders.

Favourable conditions for joint analysis of the issue

- A respectful and evenly matched relationship: willingness to understand one another
- Open dialogue: free and open contribution of one's own ideas
- A culture of research and interaction: practitioners and researchers are curious, investigative and innovation-oriented
- Process supervision or support
- Clearly defined issue supported by both educational practice and researchers: a relevant and broadly supported question has greater value
- Financing or co-financing and sufficient time for the process of demand articulation

Tips for researchers

- Keep an eye out for practical issues
- Share your questions and assumptions with practitioners
- Involve others, including practitioners, in your method of argumentation and reasoning

AGREEING ON AN APPROACH

Decide on the next step together: how will we collaborate? How will we divide up the roles?

- Formulate a solidly supported ambition, owned by the collective: practitioners, researchers and other stakeholders
- Can we make use of pre-existing insights, or should we initiate research?
- If so: formulate a broadly supported research question
- Account for any possible conflicts of interest in your discussion

Quality begins with first contact

This publication concerns the process of demand articulation in practice-based research. The purpose of this process is to identify and explore a practical issue, to decide whether research is required, and if so, to formulate a research question. Educational practitioners and researchers must join together for this process of demand articulation. The research and the answer to the research question thus formulated should help practitioners to make choices regarding the practical issue which are *evidence-informed* - based on research insights - and to act accordingly.

What do we know about the process of demand articulation? What do partners from practice and research do? How will their collaboration take shape? What methods will be effective? In this publication, we hope to provide practitioners and researchers with well-delineated tools for collaborating on an issue.

What is likely...

The beginning of a possible research project is a crucial phase demanding specific attention. In fact, it is, or should be, a shared research and learning process.[1] Demand articulation is central to this phase: the investigation of the practical issue, the decision on whether research is needed, and if so, the formulation of a good research question.
Good demand articulation contributes to effective research performance, as well as the educational improvement or innovation that is linked to a practical issue. It also increases the practical relevance of the research, as well as the chance of knowledge usage and the impact of the results.[2] These factors promote an increase in evidence-informed actions that are based on research insights.

It can often be difficult, however, to get to the bottom of a practical issue and formulate a research question. Practitioners commonly find it challenging to formulate a good knowledge question or a researchable issue,[3] and to use research insights during the demand articulation.[4] Researchers often lack sufficient knowledge of the practical side. They also can find it difficult to formulate research questions in a way that allows the research to contribute to solving the problems that confront practitioners.[5] Consequently, the insights, experiences, desires and needs of both practitioners and researchers are needed to produce good research that makes a practical contribution.[6] These ideas can be exchanged and explored in mutual discussions. The quality of practice-based research is thus dependent on the quality of the contact between researchers and practitioners.

From assumption to substantiation

Demand articulation requires that practitioners and researchers have a custom-built plan concerning the actual practical issue they are working on.[7] Handbooks offer all sorts of directions for frameworks and instruments that can be used to initiate possible research.[8] Still, despite the importance attached to demand articulation, there are proportionately few empirically supported research results available on the subject. For this publication, we went in search of what is currently known about it. We hope this will provide practitioners, researchers and stakeholders involved with education with a sound guide to collaboration during demand articulation that can possibly facilitate the process. By improvement, we mean added value: for the intended research or the decision to carry out something other than research, for the solution of the practical issue, and for its continuing impact in practice (evidence-informed actions).[9]

Parameters and approach

By practitioners, we mean persons professionally active in the field of education: teachers, supervisors, facilitators, managers, policy makers and executives. For our purposes, the terms 'practitioners' and 'educational professionals' have the same meaning. The researchers we have in mind perform research in education. They can be researchers from universities, higher education or research institutes, as well as practitioners who function as researchers (like teacher-researchers) in the area of education being studied.
We consistently use the term demand articulation, as this concept is the one most commonly used in the field of education. Other terms are used as well, such as question diagnosis or question generation.[10]
To create this practical guide, we did literature research, performed case studies and consulted experts (see appendix on our approach). We focus on demand articulation itself, which is the core of our research; its further effects are also explored.

Although demand articulation does not generally proceed in a very linear fashion, we present the components in linear form, as follows.

- The identification of a practical issue and the accompanying activities and factors (Chapter 2)
- The analysis of the practical issue with desk work and discussions, and arriving at conclusions about the resulting insights and following steps (Chapter 3)
- Determining what sort of research, if any, is desirable and, if research is chosen, formulating a suitable, usable and broadly supported research question (Chapter 4)

Each chapter begins by stating the major issues in that stage of demand articulation and what variants might appear. Then we describe the conditions (favourable factors) that contribute to the quality of the demand articulation and the likelihood of its further impact. We illustrate our findings with excerpts from the literature study and observations from the case studies.
Readers who wish to find the main themes of the results can go directly to Chapter 5. There, we collect all the insights we obtained and summarize them. We also mention the implications for collaboration between practitioners and researchers. In the appendix, we both describe our approach and mention several possibilities for further research on demand articulation processes.

1 See Andriessen, 2016; APS, 2013; Spaapen & Van Drooge, 2011; Teurlings & Beek, 2016.
2 Ros & Ter Beek, 2013; Teurlings & Beek, 2016; Weber & Rochracher, 2012.
3 Reijmerink et al., 2014.
4 Verwaijen et al., 2013.
5 Verwaijen et al., 2013.
6 Netwerk Lectoren Lerarenopleidingen, 2017; Stuurgroep OPPO, 2018; Teurlings et al., 2011; Van den Berg, 2016.
7 Ancess et al., 2007.
8 See Migchelbrink, 2014; Van Aken & Andriessen, 2011; Van der Donk & Van Lanen, 2018; Van Gastel, 2011; Van Swet & Munneke, 2017; Van Yperen & Veerman, 2008; Verhoeven, 2018; Vossen, 2013a, 2013b.
9 Ancess et al., 2007; Spaapen & Van Drooge, 2011; KNAW, 2011, 2012, 2018.
10 Andriessen, 2016; Klerkx et al., 2006; Van Aken & Andriessen, 2011.

2 Shall we have a look at this together?

The very first step in demand articulation is identifying the issue. This initial phase of practice-based research is extremely important. It is therefore essential for practitioners and researchers to search together for issues and to discuss them. How do we identify issues? And how does this first step in collaborating on demand articulation come about? There are different paths that can be followed, and a number of favourable conditions can be mentioned.

Practitioners and researchers can meet each other *at different moments and in different capacities*. They come into contact by means of published materials, social media, conferences, study programmes or a knowledge or information help desk. In collaborative situations, workplaces and joint projects, researchers and practitioners come into contact with one another and engage in discussion. For some of them, their relationships have only just begun, while others have already built up an extended relationship concerning certain issues. And sometimes this contact generates a new practical issue or a desire for improvement and innovation.
Practitioners and researchers also sometimes come into contact with one another *as a result of differing intentions and different, perhaps even contradictory interests*. For example, practitioners will point out a particular difficulty, or seek out concrete guidelines for action, support for a working method, literature or innovative research findings. Researchers might be on the lookout for participants for research, want to contribute improvements in education, or want to know more about a particular question in practice.

2.1 Types of practical signals

What situations accompany the initial idea for research, or in other words, the signal that research might help to elucidate a practical issue and solve it? We start with a couple of examples of what this could entail.

What sort of subjects lead to the identification of practical issues?

- Analyses of student results can reveal difficulties in the transition to a particular grade, or between different types of schools. But where does this problem lie exactly? An inspection by the Ministry of Education can produce points for attention and improvement, such as the pedagogical and didactic readiness of teachers to provide appropriate instruction.
- The Dutch Knowledge Roundabout (*Kennisrotonde*) receives questions about such topics as differences between student groups or effective ways of stimulating language development. There are also questions about methods for more formative testing or introductory programmes for beginning teachers.
- The Dutch Workplaces for Education Research (*Werkplaatsen Onderwijsonderzoek*) are focussed on subjects like education in a big-city context, highly gifted students, citizenship studies and personalized learning with ICT.
- A primary school teacher notices that learning performance of students in her class has improved since she began using a certain teaching method. She wonders whether her observations are accurate and seeks out contact with a researcher whom she has come to know on social media.

Obvious and less obvious practical signals

Signals such as those mentioned above can be extremely evident. This is the case when a school receives either a negative or a very positive assessment, or when student numbers rise or fall noticeably. The situation then diverges clearly from what is normal, desirable or expected, and the desire for change is overt. Pre-existing knowledge and routines, however, are not sufficient to help understand or improve the situation. The signal points implicitly or explicitly to a lack of insights or knowledge needed to achieve the intended changes. Prominent signals can also involve possible ways for change or interventions intended to bring about improvements or solve a problem situation. (Does our new approach work?) Or they can be connected to the desire to rely on particular values and professional identity in education in order to 'do the right thing'.[12] Persons involved in or associated with education may then wonder whether certain interventions actually work, or whether they are scientifically supported.

Signals can also be rather vague; sometimes there are no proper words to express what is going on. For example, practitioners may have worries or doubts about which they would like to have explanations or solutions. The signals might also concern their own areas of interest or ambition in their field. They might want to learn more about adaptive education, highly gifted students, citizenship studies, and learn to work in a more directed way.

Signals coming directly from practice or from indirect and general sources

Educational professionals and other direct stakeholders may have questions concerning their own practical experiences. For example, teachers may raise questions about new teaching methods (does it work?), about

commotion in the classroom (how do I maintain a good pedagogical relationship?), or about finding a good internship position (is the job market shifting and are we educating our students appropriately?). Or a head teacher may notice that student applications for the new school year are lower than in previous years (are parents voting with their feet? do other schools have this problem?). Student satisfaction surveys, parents' evenings and vocational committees can also yield signals that professional educators want to examine in more detail.
Researchers can also point out practical issues as observers 'from outside'. Their assessment of the field and the literature may reveal that many schools are coping with the same type of issue. Or instead, they may observe that schools are experiencing interesting developments that merit investigation. We will elaborate on this in the next section.

2.2 Favourable conditions for getting practical signals into the open

Experiences with demand articulation show that practical issues are not automatically identified and delineated. Likewise, they do not necessarily lead to contact and collaboration between practitioners and researchers. In most cases, there must be an occasion or some fertile ground to bring practical signals into the open more quickly and raise them above the level of 'day-to-day issues' or 'not enough time'. In the next section, we explore these mutually related favourable conditions.

First of all, **pre-existing collaborations or contacts in a network** are advantageous, especially when they involve innovative and investigative behaviour. The pre-existing collaboration or networks provide physical contact, familiarity with one another's work practices and the opportunity for dialogue on subjects of interest (see box).

Pre-existing networks as fertile ground for an issue

There are many ways that pre-existing networks can serve as fertile ground for practical issues. One of our case studies involved a school that collaborated with a university of applied sciences in setting up a school for teacher training and a programme for Science and Technology to enhance their own personnel's performance. Next, the school wanted to further develop itself in a specific innovative theme within the field of Science and Technology, and requested the support of the university. The university wanted to link these enhancement efforts to research by the group administering the teachers' training programme.
The reciprocal desires for professional development and research thus proceeded in a concerted way. Verbal contact produced more and more refinements, which culminated in an application for research funding from the Netherlands Taskforce for Applied Research (SIA). That application included the input of a developer-supplier of educational materials. This was an innovative partner known to the research group from occasions like the yearly student information day. At the end of the project, which took one year, it turned out that all kinds of new questions offering new possibilities for further research had emerged. These were discussed, and the principal issues for further action were determined step by step. This gave rise to a second funding application by the same three partners.

2 Second, **innovative and investigative behaviour** help bring issues to light. Practical questions are then formulated out of curiosity. Asking questions and other aspects of an investigative attitude[13] are encouraged and valued. Additionally, experience with research (as researcher, participant or user)[14] can facilitate the identification of research questions.

3 Third, **'a fresh pair of eyes'** can help to identify practical issues. A fresh pair of eyes **from outside** can be especially helpful: someone from outside the school who can view your practical situation from a different standpoint[15] and think out of the box. People who can offer a fresh pair of eyes include students, parents, interns, advisers, professionals from other schools, and teachers with a background in other professions (lateral-entry teachers). Or think of classmates and teachers known to one of your own employees who is starting a Master's degree programme.
All of them can offer different perspectives on educational practice and pose questions about matters that are considered routine. We need other people to be able to see what we cannot see ourselves.[16] Those persons involved in the case study in the horticultural sector have seen that the 'view from outside' can have beneficial effects, such as an increase in young talent (see box).

Greenbrains Venlo: 'A fresh pair of eyes from outside'

Greenbrains Venlo was a knowledge desk for entrepreneurs in the Greenport region. This area has many horticultural businesses, like growers, auctioneers, merchants and equipment suppliers.[17] The knowledge desk was founded in 2012 with subsidy from the province of Limburg and was closed in 2015. In Greenbrains, the province was collaborating with secondary vocational education and training (Citaverde College), higher professional education (Universities of Applied Sciences Fontys in Venlo and HAS in 's-Hertogenbosch) and the University of Wageningen. The knowledge desk was meant for regional entrepreneurs who had questions about knowledge and education. It served as a communication point between entrepreneurs on the one hand and educational and research institutes on the other.
Wherever possible, non-university students were asked to react to the questions. One person involved remarked on the importance of young talent with a fresh outlook: 'Young people ask questions that are not asked by people who have worked longer in the sector.' (greenportwestholland.nl)

As mentioned in the above section, researchers can also provide a view from outside. When practitioners and researchers engage in dialogue, they can help each other to become more aware of underlying, still undefined issues and implicit assumptions, notice things like comparable patterns and issues in different contexts, test their observations in ensuing discussions and thus bring an issue to the fore. However, researchers also have their own theoretical perspectives and concepts of science[18] that can influence their views on the issue. They will therefore need to question practitioner partners thoroughly about the identification, relevance and urgency of the issue.

4 Fourth, for the conditions mentioned above to be genuinely favourable, it is important that involved parties perceive enough **safety** to dare to bring signals to light (as the sender) and to genuinely hear those signals (as receiver). One example of such a signal is when enrolment in a programme is below expectations, or student satisfaction measurements are lower than in preceding years. In an innovative, investigative and safe environment, signals like these will lead to further open evaluation of where the problem lies.

5 We conclude with this addition to the previous conditions: **an explicit call** to state research questions can provide an impulse for the identification of practical issues, for example with short-term practice-based research or the NRO's Knowledge Roundabout (see box).

Raising an issue with an appeal to the Knowledge Roundabout

The Knowledge Roundabout invites professionals from all educational levels and programmes to post issues on the website in their own words. The professionals can do this by answering such questions as: What is your question? What is your reason for asking it? How will the answer benefit you? How do you plan to use the answer? (See https://www.nro.nl/kennisrotonde/steljevraag/) The answers to these questions are the basis for a conversation between a researcher (known as the knowledge broker) and the person asking the question. They further investigate the issue and clarify the request for knowledge (if present).

An explicit call to raise a practical issue, however, does not always produce a broad or desired response. Employees of the Greenbrains knowlegde desk observed that they failed to sufficiently attract entrepreneurs, who were often 'hard to reach', to its information services, even though they were the target audience. The Greenbrains knowledge desk assumes that those entrepreneurs who did submit questions were already aware of this resource.

11 The Knowledge Roundabout is the NRO's online help desk for answering practical questions about education with insights from scientific research (see www.kennisrotonde.nl).
12 Bakker & Wassink, 2015.
13 Bruggink & Harinck, 2012.
14 Teurlings & Beek, 2016.
15 Dixon, 2017; März et al., 2017.
16 Dixon, 2000.
17 Boetzkes, 2015.
18 Andriessen, 2010; Lincoln & Guba, 2000.

3 Where does the problem lie?

The most comprehensive activity in demand articulation is the joint analysis of the issue. The primary need here is to assemble and exploit different perspectives. This produces a richer and more subtle understanding of the issue and creates ownership among the participants. What common denominator do we perceive? And how can we be responsive to the wishes of the practitioners? It is important for them to make use of the insights. Various favourable conditions can also be identified in this phase.

For effective demand articulation, it is important for researchers and practitioners to further explore and clarify the practical issue identified. This step can be somewhat overlooked, or is not carefully or completely carried out in actual practice. People are eager to jump to solutions.[19]
If the essence of the issue is not sufficiently clear, people may choose for a solution that does not suit the context or is simply ineffective. It is thus vital to determine whether there could be an underlying issue or cause: what is 'the real problem'?
Similarly, when researchers have identified a problem and contacted a school with the idea that it would be worthwhile to try out a certain intervention, they will also have to check whether that intervention matches the context of the school and the relevant issues there. If this is not checked, there is a risk that the intervention cannot be practically performed in the intended manner. The intervention then produces results that disappoint both the practitioners and the researchers.[20]

The following sections contain several examples of the importance of thorough analysis of the issue.

Playground surveillance to prevent truancy

A school imposes playground surveillance as an anti-truancy measure. Evaluations show that truancy decreases. At the same time, people notice more fighting in the corridors and on the playground. Contact with the student council reveals that the motivation of students who play truant has further dropped since the checks began. Instead of promoting good relationships between students and teachers, the atmosphere at school has deteriorated. An analysis of the causes of truancy (quality of instruction? lots of free hours? appealing cafés nearby?) would have elucidated the issue better and led to appropriate interventions.

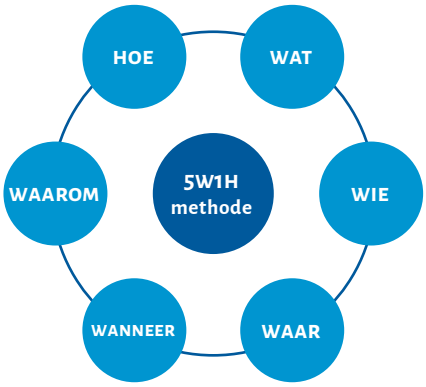
Giving points for formative tests?

A vocational education programme wants to use a point system to assess formative tests. The programme asks the Knowledge Roundabout: what answers should we award points for? What are the criteria? How many points for what? What is good, what is a passing or a failing grade? A conversation with a knowledge broker reveals that students want more interim feedback on their performance. Good-passing-failing is not sufficiently motivating for them. And teachers want a good basis for discussing students' progress with them; whether they are prepared for their exams and where they might need some extra support. The conclusion is that, before designing any kind of point system, the programme has to answer two other questions first: 1) what is the effect of grades or points on student motivation? and 2) what sort of feedback has a positive effect on student motivation and learning performance?

3.1 The analysis of a practical issue

When further exploring a practical issue, researchers and practitioners try to identify the core of the issue and grasp it. It can be helpful to link the issue with insights from research literature and other documentations, but desk work is usually not enough. Conversations or other interactions with involved parties are especially necessary for elucidating the issue in context.[21] One of the aids for analysis of an issue is the Kipling or 5W+1H method (also sometimes called the 6W method). This method is described in a number of handbooks.[22] Desk work and discussions of the issue are used to find answers to the following questions:

- WHAT is the core of the issue?
- WHO is involved?
  (Who is inconvenienced, who would profit from a solution?)
- WHY is it a problem?
  (What would the situation be if the issue no longer existed, and if the research question were answered?)
- WHERE and WHEN does the issue present itself?
- HOW did the issue arise?
  (or: WHAT CAUSED the issue to arise?)



In addition to these questions, it is also important to consider: can the issue be manipulated/solved? What attempts have already been made to solve it? What ideas are there now? What ideas generated by other research or schools have already been tried out here? What conditions are relevant here? Exploration of these factors can lead to deepened understanding (what factors are in play here?) and better and more widely applicable research results and solutions.

Researchers must also ask more detailed questions and explore diverse perspectives (see later remarks). They can help to take implicit assumptions and suppositions that are common or even too dominant, and put them into words. They can also contribute other insights and new research results. Since practitioners are already using new knowledge and research results during the demand articulation phase, their application of this knowledge can begin at a very early stage. The box below contains two examples from the Knowledge Roundabout, the second of which also states the answer and its meaning in practice.

Connecting with the contributor of the question and the context: examples from the Knowledge Roundabout

The contributor of a question on special education wondered how *the self-reflection capacity of young people with certain diagnoses* (like ADHD, autism, PDDNOS and so on) could be developed. At school, the teachers noticed that these students often find it hard to self-reflect satisfactorily. Initially, the questioner assumed that young people with these diagnoses might be incapable of self-reflection. During the demand articulation discussion with a researcher, it proved that special education students at senior general secondary or college preparatory levels did not find these assignments so difficult, but those at preparatory secondary vocational level did. The questioner and the researcher thus decided to start by looking at the students' levels, and only then considered the students' specific behavioural problems.

A second example concerns *classroom seating arrangements* (rows, clusters or Ushaped) in secondary education. The question arose from the school's new policy of arranging the classroom desks in small clusters, rather than in rows. Its author initially questioned whether a set-up where the teacher looked directly at the students might not work better. The assumption was that the normal arrangement produces more eye contact with the students, so that the teacher has a better idea of whether the message is getting through. In the discussion between the practitioner and the knowledge broker, the suspicion arose that the best choice for a classroom arrangement might be connected with learning objectives, like practising skills or more discussion during the lesson, and the students' educational level. In the demand articulation, the seating arrangement was linked to specific learning objectives (practising skills) and to specific students (preparatory secondary vocational). The answer turned out to be that the arrangement in rows is better for these learning objectives, but the U-shaped one is better for stimulating discussion among students. The contributor of the question used this information to initiate a fruitful discussion in her team about the relationship between classroom arrangements and learning objectives.

Including different perspectives contributes to a richer, more subtle understanding

When we discuss a practical issue, we notice that some people have other perceptions and ascribe other meanings to it than we do. Researchers and practitioners can also have different views, knowledge, experiences, interests and expectations concerning a practical issue. This makes it difficult to formulate a clear-cut description of the issue: which description is most suitable or the most usable? Is there really a 'best' description?

By searching - during the issue analysis - for various perspectives both from research and practice, relevant knowledge from practice and research can already be used during the demand articulation process. This increases the practical relevance and foundation of the research, and increases the likelihood of its impact. Exchanging perspectives also makes researchers and practitioners learn with and from one another. In this way, they develop a richer and more subtle understanding of the issue.

The choice of parties and persons who participate in the process of demand articulation is a determinant of the quality and result of that process. A highly diverse choice of participants provides access to many disciplines and perspectives, and much knowledge and experience.[23] These people could be teachers, school administrators, schedulers, parents or interns. The 'fresh pair of eyes' mentioned in the previous chapter can also help to analyse the issue.

It is beneficial when the participants are a truly representative cross-section of the persons and parties who are or should be involved with the issue and the research. They should possess a certain stature within their own constituency and among the project participants. It is also important to have a good balance between participants who are closely associated with each other and those who are less so. Researchers can help to determine who can best be involved with the elucidation of the problem (this is the WHO question from the 5W1H method).

To analyse an issue properly, one must include and make use of not just the perspectives of practitioners and others involved in practice, but researchers' perspectives as well. This is because researchers can have varying ways of approaching a problem, mostly because they come from different fields of science like psychology, sociology or economics, or because they prefer different theories or have particular concepts about research.[24]

The danger here is that researchers might possibly have an overly one-sided view of the practical issue. Researchers must thus be aware that their own perspectives can skew the discussion. And they must recognize that there could be alternative theoretical frameworks that are better suited to a certain practical issue in a certain context. In that case, it may be wise to call in researchers with another scientific background or other sorts of expertise.
To assemble their perspectives in a fruitful way, involved parties would do well to support those perspectives with data.[25] Useful tools for this purpose include quality scans for the demand articulation and step-by-step plans.[26] Researchers can aid this process.

Inclusion of interested stakeholders strengthens their sense of participation and ownership

There is another reason for involving and questioning a variety of interested parties during the issue analysis. It increases the chance that involved stakeholders will accept the research and its results, and implement the solution chosen for the practical issue.[27] Practitioners thus have a say in the analysis of the practical issue and its solution, and are included in a shared learning process.[28] In this way, performance of research is linked to developments in practice, and possibly professional development, training, and educational development. Moreover, the likelihood of lasting impact is increased. Finally, the differences in knowledge and interests motivate the participants to work together.[29]
In particular, if potential users of the expected research results are involved, there is a greater chance that the research will be well performed and that its impact will be greater. After all, they must do 'something' with the research results.[30]
The box below contains a few more examples of actors who can participate in demand articulation, especially with regard to its impact.

Involvement of diverse parties: examples from health care, agriculture and water storage

PATIENTS AND COMMERCIAL ORGANIZATIONS IN HEALTH CARE

Prior to the 'Portable IV drip' project, a patient drew the attention of a professor of biomedical product development to various shortcomings and disadvantages of the traditional intravenous apparatus. The problem proved to be widely felt: both personnel and patients stated that the device hampered mobility and caused unsafe situations. The professor set his Bachelor's students to work on various assignments to create an alternative to the usual device. From a number of those assignments came a concrete idea for a portable IV drip. In consultation with the patient, a bag on the hip was chosen.
Via his contacts with the Venture Lab at the university, which gives support and stimulus to students from all faculties and guides them in setting up their own businesses, the professor looked for persons interested in continuing with the development of the portable drip. Three students volunteered: a medical student, a law student and a Bachelor's student in biological engineering.

These three students worked alongside the researcher/professor to develop the portable drip. This also led to the formation of a company that was to market the portable drip. This meant that, during the production of the prototype, work was already being done on patent applications and on meeting the financial criteria for allowing the product to be properly marketed. Hospitals also had to be sufficiently persuaded to purchase the portable drip. The idea was that only then could the portable drip be of benefit for the patients.

MULTIPLE PERSPECTIVES IN AGRICULTURE AND WATER STORAGE

In a biological-agricultural study,[31] business practitioners, researchers and the government all worked together. The collaboration in this 'golden triangle' focussed on growth, innovation and strengthening of the sector. This golden triangle has now yielded a great deal of knowledge about the way in which knowledge institutes and the business world can cooperate in an issue-directed context.[32]
During the demand articulation, work was performed in networks, in which groups of entrepreneurs met to discuss a certain challenge or theme. These networks were very effective in bringing the entrepreneurs' knowledge questions to the fore. Joint collection, discussion and prioritization of the questions was essential to the feeling of ownership needed for subsequent projects. At the same time, it proved relevant that there was a sense of interest in the practical question and that the membership of the groups was diverse.

3.2 Merging perspectives into a jointly analysed issue

By analysing an issue, practitioners and researchers can learn to know each other better, to comprehend each other's language and to understand one other. If they check whether the words and terms that they use are understood by the other person in the same way, a shared language may also develop. They should then strive to come to a joint conclusion on what the core of the practical issue is, a common denominator that provides direction towards a possible solution backed by everyone. At the same time, they may choose a scientific theory or angle that best fits with possible research on the solution to the issue.
In this way, they develop a *mutual understanding* of the principal hallmarks of the issue: what really matters, what is the essence? The questions from the 5W1H method can be useful here. For the method's HOW and WHY questions, the collaborating partners look for explanations: assumptions or supporting statements about why the problem arose or why new interventions will work. This is the case in the example of short-term educational research in the following box.

Creating a working theory together: example of a short-term educational study

In a short-term, practice-based educational study, a practical issue concerning a self-designed mode of instruction was the origin of a discussion between a researcher and a practitioner. It focussed on the questions of how much effect the self-designed instruction mode (mind maps) had on educational benefits (critical listening) in pre-schoolers. During the elaboration of the issue, the practitioner supplied insights from practice while the researcher supplied knowledge from research literature. In the process, they investigated the degree to which the practical question (how can we promote critical thinking in pre-schoolers?) occurred more widely in the field of education. A number of facilitators and intermediaries were also involved in this project. In extensive joint discussions, they attempted to uncover the working mechanisms of the mode of instruction. According to the researcher, they "talked, talked, talked". The end result was a kind of joint working theory on the possible working mechanisms of mind maps for learning to listen critically. This working theory formed the basis for the research.

Another example is that of the Knowledge Roundabout, which often searches for assumptions about relationships between intervention X and effect Y (X > Y). In the earlier section *Connecting with the contributor of the question and the context* on page 14, the practitioner's initial assumption in the first example is that students' behavioural problems (X) negatively affect their capacity for self-reflection (Y). In their discussion, the practitioner and the knowledge broker came to realize that things are probably different, that the students' level (X) affects their capacity for reflection.
In the second example from the same section, the initial assumption is that arranging classroom desks in rows (X) promotes more eye contact between teacher and students (Y). This should permit teachers to better assess whether they are successfully achieving the desired learning objectives. The question as eventually formulated includes the assumption that learning objectives and student characteristics determine which seating arrangement is most suitable for achieving the desired learning objectives.
The combination of different relationships may bring about a larger chain of reasoning, or a number of them, which can subsequently be tested with literature study or new research. Such chains of reasoning for example can be built by following the logic of Context-Intervention-Mechanisms-Outcome (CIMO).[33]

The above examples show that effective use of the 'learning potential' of various perspectives is an art in itself. We also know this from a more generalized area of research literature, not specifically linked with demand articulation, on boundary crossing.[34] You must be able to switch, link, build, weigh alternatives and adjust. A role of this type is assigned to the brokers (boundary crossers) in the Utrecht Workplace for Educational Research. These are students in the teacher training programme, most of them teachers enrolled in a Master's programme or doing dissertation research. They have a key role in establishing research themes. They operate in the worlds of both education and of research, and are therefore in a good position to bring scientists (external supervisors) together with school teams.

A broker speaks

The Utrecht Workplace for Education Research (WOU) is a collaboration between three large school boards, three teacher training programmes and two universities. The research themes and questions originate from learning communities in the primary schools and may differ in subject from one another. Jort Jacobs, teacher and broker in one of the participating primary schools, gives an example of demand articulation in the schools, connected to both the entire school team and to prior knowledge from research. "In the Utrecht Workplace and in our school as well, we have intentionally chosen for a bottom-up approach. Consequently, we started by holding a study day for the whole team. The goal was to make the urgency and the ambitions of the research clear to everyone. During a second study day, we explained the theoretical concepts that underpin our research and outlined its frameworks. We intentionally did not fill all the blanks ourselves, but asked the team to brainstorm with us about the best way to tackle this question. Because the whole team was involved in the elaboration of the research question, genuine interest in the research spread throughout the school and the support for our research increased. That was certainly very important for our research, because everyone was expected to take part in the learning experiment."[35]

As they collaborate, practitioners and researchers become aware of the details of each other's practical situation. They also begin to see differences with their own practice (identification). During the demand articulation process, they additionally begin to make use wherever possible of other people's methods, means and goals. For example, they agree on who will use what research methods to collect information from practice, or what insights from literature they will draw on (coordination). Besides, perspectives are gradually broadened and deepened. Exchanges of perspective also take place (reflection), and the other side's perspective may cause a new perspective on the collaboration to take shape (transformation). This allows the parties to work towards a joint perspective on the practical issue and on the chances and possibilities for continuing a constructive research collaboration. The boxes below and on the next page give several examples.

Making acquaintances during design workshops: the genesis of a common denominator

The SIA KIEM program is intended for investigative research by universities of applied sciences in collaboration with small- and medium-sized businesses and the public sector. One person involved in an application for KIEM told us how the prior cooperation between a higher education research group and an innovative partner in the professional field was supplemented with other partners from vocational education and teacher training. These partners met one another in so-called design workshops. It proved that each of the partners had their own interests in this collaboration, based on their own perspective. One benefit of the project was that a common denominator was formed. The long acquaintance procedure during the design workshops was especially conducive to bringing perspectives closer together and making prejudices disappear. KIEM offered time and openness to create this kind of situation.

Interaction and re-design during demand articulation in the agricultural sector

A researcher gave us an example of problem-resolving interactions in networks with entrepreneurs in the horticultural sector, where he was a process supervisor. “In my experience, interesting things happen when growers of different plants start sounding off against one another. Then they start to think in processes. They see the wider picture better because they compare growing tomatoes with growing chrysanthemums. They start to notice differences and that's very important.”
Conversations like these might be about a problem with pricking out young plants. Often the first thought for a solution is something like working harder, hiring more people, educating them better, imposing more penalties. But the entrepreneurs might also think about cultivating other varieties or using a different pricking machine. The researcher feels this has to do with re-designing things. This makes people look at processes. When talking with the entrepreneurs, the researchers observed how they arrived at their previous way of working, and asked if they could take a step backwards and try it in a different way. Essentially, they were doing a sort of problem analysis (examining what does work in the process and what does not), and searching for a new, alternative route. Researchers can provide help and support with that problem analysis and with ‘thinking in processes’. This also helps to build relationships.

From individual learning questions to shared themes and research questions in learning studios

The Workplace for Educational Research in Brabant elucidates problems in secondary education at so-called learning studios. In a learning studio, teachers from three schools, a teacher trainer and a mix of students work side-by-side. Teachers and students present their own learning questions, and the schools present theirs as well. In the learning studio, the studio supervisor guides them in an interactive group process towards shared themes, and they formulate recommendations. ‘Outside groups’ of other involved parties react to the recommendations. This approach is meant to lead to a match between the learning questions from teachers and students and the questions from the schools.[36]

The process of searching for consensus and shared ideas can be accompanied by the re-definition of the issue. By working in accordance with practice and linking the issue to new insights from science, the issue is viewed and formulated in a new way. The previous section *Connecting with the contributor of the question and the context: examples from the Knowledge Roundabout* on page 14 gives examples of this.

The whole is greater than the sum of its parts (1+1=3). Blindfolded people use touch to find out what object or phenomenon they are encountering. Each of them perceives different things separately: a snake, a spear, a fan, a wall, a tree and a rope. If they consult one another, they can deduce more quickly that they are dealing with an elephant.

The joint or new view can then be said to represent a 'temporarily workable agreement'[37]: a view that is sufficiently accepted for the parties to initiate action. Even if the parties have significant differences and there are varying perspectives as to where the truth lies, a well-supported and shared perspective exists on how to solve the issue. This can form the basis for productive collaboration in the future.

3.3 Favourable conditions for arriving at a jointly analysed issue

There are a number of favourable conditions that allow researchers and practitioners to analyse an issue effectively together. These issues are described below.

1 A **respectful and equal relationship** is beneficial. In such a relationship, the collaborating partners believe that the other party can make a unique contribution towards the analysis and solution of the issue (compare this with safety as a condition in Chapter 2). The partners want to understand each other and arrive together at a shared insight. The partners must be able to openly discuss their insecurities and concerns and to explicitly state their assumptions. It is also important for them to listen without judgement to the other party, to be willing to develop shared ideas together and to cooperate with others to achieve this.[38] Also see the following box.

The relationship matters

In the agricultural sector, we spoke with the researcher who functioned as knowledge broker with the Greenbrains knowledge desk. This researcher found it very important to invest in relationships. "We called it a help desk, but it was actually about investing in relationships," he said. "If you invest in that relationship, people will come back. You have to get to know one another, know how you stand with them, during the demand articulation too. During the problem analysis, you bond with the entrepreneur. You construct a mutual, realistic image of the desired future, which makes it much easier to present arguments for the investments in R&D that are needed to get there.
There is a common responsibility to achieve a good demand articulation process, and the mutual relationship plays a significant role in this. To do this, you have to go visit the entrepreneur, see the business and talk with them. Sometimes the entrepreneur has to admit that a different approach would work better. Trust is very important in such cases."

In its own handbook, the Knowledge Roundabout has used its four years of experience to identify the following success factors for good demand articulation.

Support
- Give highest priority to practical interests.
- Explain what you can do for one another.

Understanding each other well
- Listen carefully to one another.
- Think hard about the practitioners concerns and what research has to say about them.
- Strive for a common language: join scientific jargon to practical jargon.

Relationship
- Make real contact.
- Be open to the other person, show real interest in each other.

One party's interests should not dominate the other's; you are searching for shared interests. Both parties must be able to attach sufficient value to the collaboration. This requires a good rapport and a respectful and equal relationship of trust between the collaborating parties.[39] Researchers should present themselves as developers of shared knowledge, rather that top-down suppliers of new insights. This creates an atmosphere of shared ownership and values. However, this also depends on the way in which the collaborative partners divide up the tasks among themselves or shoulder them together.[40]

As all this implies, all parties must be able to **present their own experiences and ideas freely and openly** by brainstorming together[41] or with other forms of communication. When it is desirable to reach agreement or shared insight, other ways of working may be more suitable, such as the dialogue method.[42] (See the section on methods and working practices later on.)

A **culture of investigation and interaction, and competencies that match them,** are favourable to the analysis of an issue. In a culture such as this, exploratory learning and interactive cooperation is an everyday thing. The organization supports, stimulates and facilitates this: this is how we do it here. Involved parties are open to other people's ideas. They also have sufficient communication and listening skills, and an open attitude that allows them to converse freely with others.

Actors in an investigative and interactive culture are curious, inquisitive and innovation-oriented. They are prepared to further hone their professional skills and experiment in practice. They make it clear that they genuinely want to analyse, investigate and come to grips with practical issues. They also seek out colleagues and others who will collaborate with them to this end. Outspokenness and experience with or participation in research are also helpful here.[43] Our experiences with the Workplaces for Educational Research, for example, reflect this.

These competencies are especially important for researchers. They are looking for relevant practical knowledge and experiences and for insights in concrete practical contexts, and need to be willing to ask questions about them. This process is helped when researchers understand, or are willing to understand, the practical context as well. Research at the Workplaces for Educational Research underlines the fact that researchers fulfil a role as examples of investigative professionals. They assume a critical attitude, ask questions and invite others to do so. The researchers also share knowledge and try to inter-relate the various angles coming from research and practice. In this way, they stimulate professional dialogue and reasoning, They embody the culture of investigation at the school. They extend the shared development of knowledge.[44]

It can sometimes be useful to have **process supervision or support for the collaboration** between researchers and practitioners. Process supervisors can offer both process-related skills and knowledge of participative techniques for development and research. At the same time, they can help to build mutual trust and strengthen people's resolve to re-orientate themselves to the issue.[45]

Practical experiences demonstrate that it is beneficial for the practical issue to be **so well-defined** that it is feasible, achievable and realistic to solve it within the context. It must also be **supported** by practitioners as well as researchers.[46] Then one can speak of ownership. The parties then acknowledge a shared ambition to work on the issue and thus contribute to improvements or innovations in educational practice. The complexity of the issue is in accordance with what is attainable and feasible.

6 Here, it is important to consider the amount of **time** that the parties have available for the demand articulation. It can frequently be rather limited. Specifically, the limited time that practitioners have for participation in practical research is a factor that demands consideration.[47]

7 In connection with this, **financing and co-financing** can have a beneficial effect on demand articulation. This is shown by experiences within the sectors of education, health care and agriculture. For example, health-care research revealed[48] that it is preferable for the demand articulation process to be performed *before* the subsidy for the research project is awarded. When financing is arranged first, in the hope that the partners that the partners will work on the demand articulation, there is a risk that this process will only amount to a 'solo effort by one person sitting at a desk', rather than a genuine exchange of ideas.
Separate financing for joint performance of the demand articulation can have the effect that the partners get to know each other prior to the research and can make a joint effort to analyse the practical issue and formulate the research questions. This means that it is advisable to provide subsidy that will facilitate early interaction between researchers and practitioners.[49] This is already true of calls for proposals intended for NRO's practice-based research projects.
It is not only the financing from the funding body that influences interaction between researchers and practitioners: this can also be true of co-financing.[50] Such co-financing of the demand articulation phase can take the form either of a financial contribution, or a contribution of products or services. One example of such an arrangement is the SIA KIEM program, which is directed at network formation and demand articulation.

8 Finally **adeptness at working with different methods and work practices** is important for choosing the appropriate approach to different demand articulation situations and summarizing their benefits, using a technique like the 5W1H method as a template or checklist. In the section on Methods and working practices in demand articulation, we give more detail on these and several methods and practices. Research has described these examples in detail; various handbooks on practice-based research contain these methods and others as well. On the basis of our literature study, we can make no judgements on the effectiveness or added value of the methods they contain. It depends partly on the intended nature of the conversation (for example brainstorming or reaching an agreement). It is probably so that quality of the conversation will prove generally more important than concrete methods, but no research on this subject is available. The methods vary in their approach and intention, and likewise in effectiveness according to the situation.

Methods and working practices in demand articulation

In this section, we mention several examples of methods and working practices from literature that can be employed during the demand articulation phase. Readers who desire more detail are referred to the literature in question.

The method of **brainstorming** can help to collect ideas and assemble perspectives.[51] The intention here is not for partners to converse, discuss things, or agree with one another. Instead, they are supposed to bring together perspectives and arrive at ideas, sometimes creative ones, and to use other people's experiences in the process. The point of a brainstorming session is that the participants can generate ideas without judgement or prejudice, and use others' input while doing so. Brainstorming can take place in face-to-face sessions, and in digital settings as well. Enough evidence has been accumulated to show that brainstorming effectively produces a larger or better yield than when the participants are on their own.

To achieve more collectivity, the method of **dialogue** is recommended.[52] By dialogue we mean a 'social situation in a community of people who think similarly'.[53] Consequently, a dialogue can be carried out by more than two people. During a dialogue, people try to grasp the other person's point of view, without judgement. They literally try to look through the other person's eyes. Both conversation partners perceive that their way of thinking and reasoning is taken seriously, but also that it may be subject to serious discussion. It is not about 'proving that you're right' or forcing your point of view on the other person. On this point, dialogue is decidedly different to the discussions or debates that often take place in science. The goal is rather to arrive together at a mutually supported and possibly new insight.

The **world café** method facilitates shared dialogue in which participants exchange ideas at different tables. The participants regularly change tables to discuss new topics. The method follows seven principles:

- Focus on specifying the topic
- Create a friendly atmosphere
- Focus on core elements
- Encourage everyone to contribute
- Strive for 'cross-pollination' and unite different perspectives
- Listen together to patterns, insights and deeper questions
- Analyse and share the results

An international group of 25 researchers and 25 practitioners applied this method to find research topics for measuring sustainability.[54] Both researchers and practitioners came prepared with ideas that they discussed together. Next, they used the **world café** method to strengthen the **dialogue** and increase their mutual understanding. They structured their results using the 5W1H method. After evaluation of the meeting, the conclusion was that the method can be of value in obtaining shared and participative insights on complex topics. One perceived advantage was receiving direct feedback on ideas as opposed to mentioning themes on the basis of a literature review or using questionnaires.[55]

Other methods and working practices described in research literature for obtaining a shared issue analysis are focus group methods, a future search conference, the appreciative inquiry method, the nominal group technique and the open space method.[56] Research also mentions backcasting, traditional methods, the NS method, the pressure cooker, demand articulation from a systematic perspective and Dr De Bono's six hats.[57]

19 Teurlings & Beek, 2016.
20 Teurlings & Beek, 2016.
21 See Donovan et al., 2013; Reijmerink & De Jong, 2015; Verwaijen et al., 2013.
22 See Migchelbrink, 2014; Van der Donk & Van Lanen, 2018; Van Swet & Munneke, 2017; Verhoeven, 2018.
23 Smit et al., 2010.
24 See Andriessen, 2010; Lincoln & Guba, 2000.
25 Ancess et al., 2007.
26 Verwaijen et al., 2013; Smit et al., 2010.
27 Compare with Den Boer et al., 2011; Štemberger & Cencič, 2016; Van Bon-Martens et al., 2017.
28 Boon & Horligs, 2013.
29 Boon & Horligs, 2013.
30 Den Boer e.a.2011; Kok & Schuit, 2012; Teurlings & Beek, 2016.
31 Koopmans et al., 2011.
32 See also Geerling-Eiff & Dijkshoorn-den Dekker, 2015.
33 Van Aken & Andriessen, 2011; Van den Berg et al., 2012.
34 Akkerman & Bakker, 2011; Akkerman & Bruining, 2016; Bakker et al., 2016.
35 NRO and PO-Raad, 2018, p.78.
36 Sipkens et al., 2018, p.18.
37 Wierdsma & Swieringa, 2017.
38 Aarts, 2015.
39 Ancess et al., 2007.
40 Boon & Horligs, 2013.
41 See Paulus & Kenworthy, 2019; Smit et al., 2010.
42 See Aarts, 2015; Dixon, 2000.
43 Teurlings et al., 2011.
44 Exalto et al., 2018.
45 Koopmans et al., 2011; Sol & Beers, 2009.
46 Ros et al., 2018.
47 Fonger, 2015; Štemberger & Cencič, 2016.
48 Reijmerink, 2018.
49 Boer et al., 2014; Reijmerink et al., 2014; 2015.
50 See Reijmerink, 2018; Spaapen & Van Drooge, 2011.
51 Paulus & Kenworthy, 2019.
52 See Aarts, 2015.
53 Dixon, 2000, p.74.
54 Silva & Guenther, 2018.
55 Silva & Guenther, 2018.
56 Merkx, 2012.
57 Verwaijen et al., 2013.

4 What next?

The third activity is deciding how to proceed. This is the subject of this chapter. Now that the issue has been analysed, what is a good way to continue? What is the mutual intention? And if research is indicated, what will the research question be? It is important to formulate the research question in such a way that it will contribute to the solution of the practical issue and its impact in practice. There is also a need to weigh conflicting interests.

4.1 From a shared practical issue to mutual intentions

On the basis of the shared practical issue, the researcher and the practitioner can determine whether and how to collaborate and how to divide up the roles. At the same time, a jointly supported and formulated ambition arises. Its owner is the collective: here, researchers, practitioners and other stakeholders. The ambition is to do or achieve something *together and in mutual accord* and draw energy from it.[58]

Possibly, this collective will first need knowledge and insights already available elsewhere. By formulating a research question that can be answered with literature study, the parties attempt to obtain more knowledge of pre-existing research-derived insights. They may also not choose for research at all, rather for a training or supervisory programme for the school or schools in question. Then they will have to seek out the experts or institutions best suited for that purpose.

Conversely, there may be enough practical insight in a previously designed intervention to solve a practical issue with it. There might also be a need to support the jointly formulated assumptions with research literature, or to investigate whether and how the intervention actually works (or works elsewhere), and why. Research insight and techniques can then furnish support for and clarification of the underlying working mechanisms.

If the collaborating partners already possess enough insight into how the interventions work and design-based research is appropriate, they can then implement the new practical interventions or continue to develop them. How does that work best in our case, and what can we learn from this? Pre-existing research methods and techniques can then be employed to support the implementation and development of the design. This permits research results to supply input for further practical developments and to contribute to the solution of the practical issue. Research can also shed light on the mechanisms that are vital to implementation.

There might also be an issue that is perceived by both practitioners and researchers as wicked problem, one so complex that pre-existing insights are not enough. Practical developments proceed at a rapid pace and the resulting knowledge is often difficult to apply in other contexts.[59] New research can then be needed to grasp the issue more fully, to better understand possible solution strategies and to provide practical support in achieving improvements or innovations.

4.2 The selection and formulation of a usable research question

Once the practical issue is clarified and a decision has been made to perform research, researchers and practitioners can work together to formulate a usable question for practice-based research. The ensuing research will contribute to the solution of the practical issue. Formulating a good research question is no easy matter. There are various methods: the box below outlines several of them.

Mutual selection and formulation of research questions

In the United Kingdom, a modified version of the Delphi method has been used as an activity for joint formulation of research questions in a natural history museum.[60] There, the involved parties took part in a discussion workshop where possible shared research themes were generated and evaluated. Subsequently, the authors summarized them in visual form, then clustered and arranged them into a number of possible overarching research themes. The workshop participants, with several assistants, prioritized the potential research themes in two rounds of email questionnaires, after which a number of research questions were finalized.

In a study on water shortage, knowledge questions from practice were identified.[61] Participants were selected during the demand articulation. Workshops were also held with end users and stakeholders to establish their first priorities for the questions. Next, informed experts answered the questions in a quick scan and participants decided whether the answers were adequate or gave rise to subsequent questions. The project yielded several products, including a report in the form of a 'cookery book'. Participants felt that the mutual definition of the subject and its subdivision into themes at the beginning of the project was successful.

In the so-called Breakthrough Project for Workplace Learning in health-care institutions of the Rotterdam-Rijnmond region, the first step entailed literature study and descriptive workplace learning in the participating learning departments.[62] This preliminary research was the input for three meetings between researchers and educators from the schools and workplace learning departments. The participants in these meetings drew conclusions from the preliminary research, decided on possibilities for interventions and identified possible in-depth research directions. Next, they used their personal top three priorities to establish and elaborate on mutual priorities. The fourth meeting involved a discussion of the researchers' full proposal for research, professional development and improved instruction. The main research question thus became 'How do prior matching and relationships during the learning project in the departments lead to better learning results and added value in comparison with individual projects?'

Having selected and formulated a relevant, feasible and supported research question, the collaborative partners can go in search of further support or contradiction of the joint assumptions they have formulated, as well as possible working mechanisms of the practical issue. The formulation of the question has implications for the way in which the research can be executed and the roles that the research partners will play in it.
The anticipated research outcomes must be able to contribute to practical choices and perhaps have continuing impact on educational practice. This goal is also a factor in choosing and precisely formulating research questions. For further direct advice on formulating research questions, the reader is referred to various handbooks.[63]

4.3 Favourable conditions for arriving at decisions and research questions

When deciding whether or not to perform practice-based research, and when choosing and formulating the research question, it can be helpful to introduce possibly conflicting interests of researchers and practitioners into the equation. Besides, there can also be conflicting interests and priorities within the educational institution that must be taken into account. The box below gives an example.

Accounting for conflicts of interest

An example of accounting for conflicts of interest is found in a case study where a researcher and a communications professional did joint research in the area of telecommunication.[64] Although the researcher initiated the collaboration, supplementary research questions were later formulated by means of mutual dialogue and the research process was modified to fit the specific context of the organization, AT&T. In a process of dialogic negotiation research, questions were formulated that were relevant for both parties. While an overly academic question can generate theory formation but not necessarily yield applicable practical knowledge, a practical question may not conform to academic standards. By working through this conflict, a new research question was formulated. Participants perceived this process as positive and modified their ways of thinking about communication and research.

58 Castelijns et al., 2009.
59 Van den Berg, 2016.
60 Seakins & Dillon, 2013.
61 Smit et al., 2010.
62 Van den Berg & Streumer, 2011.
63 See Franken et al., 2018; Ros et al., 2018; Van der Donk & Van Lanen, 2018; Van Aken & Andriessen, 2011; Van Swet & Munneke, 2017 and Verwaijen et al., 2013.
64 Palmeri & Tuten, 2005.

Insights for practitioners and researchers in a nutshell

Demand articulation for practice-based research is a process in which professional educators and researchers identify and explore a practical issue, decide whether research is needed, and if so, formulate a usable research question. The investigation of the research question thus formulated, as well as the answer to it, must help members of the profession to make choices with regard to the practical issue which are *evidence-informed* - based on research insights - and to act accordingly. In demand articulation, practitioners and researchers should, indeed must be able to operate in coordination. What do we know about this process from research literature and practical experience?

A likely assertion is that the activities of practitioners and researchers in the first stages of practice-based research have considerable consequences for the performance, results and impact of the research. It is also likely that demand articulation 'from behind a desk' is not satisfactory and that discussion of an issue must take place with other parties such as teachers, management, students, parents and businesses. This provides a richer and more subtle understanding of the practical issue in its context. It also generates more empowerment and ownership among involved parties.
The current publication *From Practical Issue to Research Question* is meant to provide an impulse to practitioners and researchers with a more thought-out and coherent guide to collaboration in demand articulation. The empirical support from research literature on demand articulation, however, has its limits. In the end, few studies were found which explicitly focussed on the process of demand articulation by researchers and practitioners. With supplementary literature studies, we did attempt to ground the demand articulation phase in insights on cooperation and mutual learning among researchers and practitioners in a wider sense. We also executed case studies in six contexts which amply supplement the literature study and our additional literature study. Finally, we presented our initial findings in an experts' meeting.
On this basis, we have seen that demand articulation for practice-based research is a shared research and learning process with the following hallmarks:

- It begins with a practical signal and concludes (if desired) with a jointly supported research question.
- It often proceeds not linearly, but repetitively.
- Both practical and research knowledge are used.
- Its perspective is to contribute to a solution for the practical issue and to its impact in practice.

During the demand articulation process, researchers and practitioners perform the following activities together, each with its specific hallmarks and conditions.

The first activity in demand articulation is to identify a practical issue and then seek contact with partners from research or practice to examine it together. At this point, the choice to do research need not be fixed.
Signals can either be obvious or less so, and can be presented by the practitioners themselves or the researchers in a direct or less direct way. Nothing is good or bad. However, it is important to be conscious of the various paths by which a question can be raised.

Favourable conditions in this phase are the presence of networks and a culture of innovation and investigation. Also conducive are a fresh pair of eyes and the feeling of safety to speak one's mind, and to listen. It may help to issue a direct call to raise issues.

The second, most comprehensive activity in demand articulation is to analyse the practical issue. It is important for researchers and practitioners to do this together with care, and to involve various stakeholders and their perspectives in the process. This creates not only a richer and more subtle understanding of the issue, but more ownership as well. In particular, it is vital to involve the principal users of the new research results: after all, they are the ones who will be 'doing something' with the new insights.
After assessing the perspectives, it is also important to combine them. This requires interactive, repetitive and investigative work, and culminates in the formulation of a common denominator. This process may also include the mutual re-definition of the issue.

Favourable conditions for the joint analysis of the practical question are a respectful and equal relationship, free and open dialogue and a culture of interaction and investigation. Process supervision or support can sometimes be useful.
Solution of the issue must also be achievable, feasible and realistic given the practical context and the collaborative partners; this requires time.
Financing and co-financing can help to create favourable conditions. Finally, it is beneficial to be flexible in working with various methods and working practices.

The third activity is deciding how to proceed. Now that the issue has been analysed, what is a good way to continue? What is the mutual intention? And if research is indicated, what will the research question be? It is important to formulate the research question in such a way that it will contribute to the solution of the practical issue and its impact in practice. There is also a need to weigh conflicting interests.

Message to practitioners and other partners from practice

Do not hesitate to come forward with questions, discuss them and involve researchers. Make contact and be outspoken. State what your questions and assumptions are and support them with your perceptions, experiences and insights. Consult research literature when possible. Be aware that searching for lasting solutions to issues can sometimes take more time than you would like.

Message to researchers

Keep yourself open to concerns from practice. Initiate discussion on this topic and include practitioners and other stakeholders in that discussion. State what your questions and assumptions are and support them with research literature. Involve others, including practitioners, in your method of argumentation and reasoning. Draw parallels between practice and science; in both domains, knowledge is relative and context-bound. Keep investigating with an open mind, even when 'research has shown that…'.

Message to researchers and practitioners together

Go through the process of shared demand articulation more consciously and try to describe it more explicitly. Reflect regularly on the process. This can improve the quality of the demand articulation and the ensuing steps.

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APPENDIX
Approach for the overview publication and future prospects

Against the background of the issue and goal as described in Chapter 1, we formulated the following research questions on demand articulation in practice-based educational research.

1) What activities and conditions in the interactions of researchers and practitioners during demand articulation contribute to a) the analysis of a practical issue, b) the formulation of a broadly supported research question and c) evidence-based actions in educational and instructional practice?
2) Are there differences between and within groups of practitioners and researchers (such as sector, occupation, experience with research, practical familiarity of researchers)?
3) Are there any differences stemming from the nature of the issue (its relative complexity?) and the need, if present, for research (literature research or new research, context-specific or generic, and practice-based research or practical research)?

To answer the research questions and arrive at the intended practical guide, we first performed a brief international *literature study* of available empirical research questions on demand articulation. Here, we systematically searched for research articles, preferably peer-reviewed, which concerned demand articulation as part of research or broader cooperation between researchers and practitioners with demand articulation as a component. Next, we performed partly parallel *case studies*, which supplied us with concrete examples of collaboration between researchers and practitioners in the context of demand articulation. These case studies also yielded supplementary literature. We tested our initial findings in an experts' meeting.
Below we provide more information on the literature study, the case studies and the experts' meeting.

Approach to the literature study

The literature study was carried out by Barbara Janssen, an independent organizational consultant and project manager for Stellenbosch Consulting, educator and adviser for the Centre for Evidence-based Management, and answer specialist for the Knowledge Roundabout. She is an expert in the performance of systematic literature research.
The following two databases were used to search for research publications: Business Sources Elite (BSE) and the Education Information Resources Center (ERIC) of EBSCO Information Services. The following search filters were applied: 1) scholarly journals, peer-reviewed and 2) published from 2000–2018. She searched for:

1 Research publications on demand articulation in practice-based educational research
2a Research publications on demand articulation in practice-based research other than educational research
2b Research publications on demand articulation in education not focussing on research
2c Similar material in domains other than research
2d Research publications on collaboration between researchers and practitioners

Searches were performed using combinations of various search terms. Seventeen different search queries were made, resulting in 300 studies. See Table 1 below for an overview.

Table 1 - Search terms & hits for demand articulation: 10 October 2018

Search terms	BSE	ERIC
S1: TI(develop* OR generat* OR formulat* OR clarif" OR explor* OR articulat* OR produc*) OR AB(develop* OR generat* OR formulat* OR clarif" OR explor* OR articulat* OR produc*)	879,535	259,608
S2: TI("research question" OR "enquiry question" OR "practitioner question") OR AB("research question" OR "enquiry question" OR "practitioner question")	2,125	1,332
S3: TI("clean language") OR AB("clean language") (2c)	4	2
S4: TI"demand articulation") OR AB("demand articulation") (2c)	5	1
S5: TI"needs analysis") OR AB("needs analysis") (question 2c)	123	251
S6: TI("collaborative research*") OR AB("collaborative research*")	636	1,097
S7: TI(cooperation OR collaboration) OR AB (cooperation OR collaboration)	51,942	47,065
S8: TI(researcher-practitioner OR practitioner-researcher OR academic-practitioner) OR AB(researcher-practitioner OR practitioner-researcher OR academic-practitioner)	500	599
S9: TI(education) OR AB(education)	84,431	515,946
S10: S1 AND S2 (question 2c)	1,291	861
S11: S7 AND S8 (2d)	43	66
S12: S11 OR S6	676	1,162
S13: S10 AND S12 AND S9 (1)	0	2
S14: S10 AND S12 (2a)	2	4
S15: S10 AND S9 (2b)	82	387
S16: S5 AND S9	12	84
S17: (S3 OR S4 OR S11 OR S13 OR 14 OR S15 OR S16) AND AB(review)	21	54
Total	**87**	**213**

On the basis of their titles and abstracts, the 300 articles were assessed for relevance. This phase yielded 27 articles. Subsequently, these articles were appraised on the basis of the full text. Articles were selected whose focus lay in at least two of the following areas: demand articulation, collaboration between researchers and practitioners, and education (inclusion criteria). Articles were excluded if

1. the areas mentioned above were mentioned in the study but were not explicitly its topic
2. the article was about the spread of research to practice (the push issuing from research)
3. demand articulation was related to educational content (what should receive attention in education?) and not to issues for practical research

This step of the literature study yielded nine articles. Besides the results of this systematic search, articles were also added which were collected and supplied by the main performers of the research over the course of the project. These articles were appraised by means of the same selection process. They totalled 16 articles, of which six were included in the review after the assessment. Figure 1 presents an overview of the entire selection process.

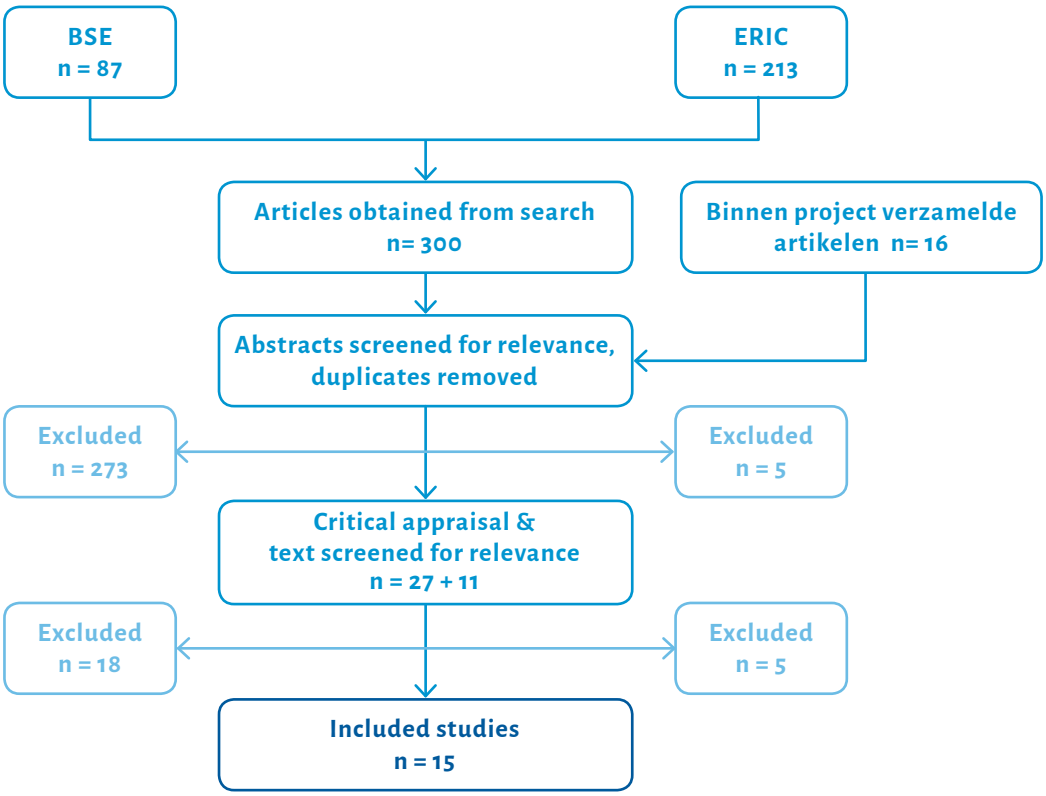

Figure 1: Process of article selection

Despite the wide-ranging start, few studies were eventually found that explicitly focussed on the entire process of demand articulation by researchers and practitioners in education. The 15 selected publications were described in a summary that formed the basis of the present report, in combination with the results of the case studies.

The publications consist largely of case descriptions, non-systematic literature reviews or examples not coming from the field of education. All things considered, there was little empirical material to be found that could affirm the effectiveness of the activities or conditions described. Because a number of the activities and conditions were mentioned in more than one study, we considered these activities to be relevant as well.

Approach to case studies and collection of supplementary literature

Besides the literature study, case studies, some of them parallel, were carried out. We searched for cases within subsidized contexts, because we anticipated that these would be better documented than other cases. We also made the assumption that what holds true within subsidized contexts would also be true in other, non-subsidized contexts. We tested this assumption during the experts' meeting (see further on).

Three of the examined cases concerned practices within the educational sector (Knowledge Roundabout, two projects of Short-term Education Research NRO-PPO and Workplaces for Educational Research) and three were performed elsewhere or had a broader focus: the Green sector (in particular, the Greenbrains information help desk), SIA (in particular RAAK, MKB and KIEM), and ZonMW/Health Care (in particular the medical

subsidy award for the portable drip). Using an exploratory set of attention points, we investigated the various cases with document analyses and interviews. The case studies were largely exploratory in nature, and their goal was to further probe the research theme and to collect pertinent practical examples.
For each case, we began by creating an integral case report referring to relevant passages from the document, data on key figures and interview results. Next, a fixed list of items was used to make a table for each case with concentrated analyses of the case report. References in the report to the case studies have to do with documentation on the cases or interviews with involved parties.

During work on the case studies, supplementary relevant information was also found beyond the publications in the systematic literature studies. This supplementary literature generally had the character of policy evaluations, policy documents or future projections. As far as empirical studies are concerned, these were covered in the previously discussed literature study.
We also utilized literature dealing with constructive collaboration between parties with different perspectives, such as researchers and practitioners. This last supplementary literature was used to supply further theoretical support for our research results.

Approach to the experts' meeting

On 11 March 2019, an experts' group was invited to consider along with us the preliminary outcomes obtained from the case studies and the literature study. What did we know or not know? What dilemmas presented themselves and what could be said about them? Both practitioners and researchers with experience of collaboration in demand articulation were invited to join the experts' group. None of them were involved in one of the cases studied. The intention was to have five research experts and five practitioner experts take part. Despite widespread and repeated calls via various channels and people's efforts to keep their diaries free, in the end nine experts intended to participate in the meeting.

- Suzanne Beek: policy employee for The Hague municipality and former adviser to KPC Group.
- Hannah Bijlsma, teacher (De Cirkel): doctoral candidate (Tilburg University) and chair of the Professional Association of Academicians for Primary Education.
- Maartje Kouwenberg (NRO): policy employee, former researcher for the Auris Group.
- Femke Merkx, expert in knowledge co-creation. Author of the Rathenau report *Collaboration on workable knowledge. Methods and techniques for knowledge co-creation* (2012).
- Lisette Munneke (Utrecht University), lecturer-researcher for the department of methodology for practice-based research, research on the didactics of developing investigative ability: for example, how do you teach students to arrive at a good research question?
- Irma van der Neut (IVA Education): researcher with experience of demand articulation in connection with NRO subsidy applications, recently active in teaching educational research with ICT (primary and secondary vocational).
- Esther Ottow (Auris Group): speech therapist, active as researcher for Auris Group (health care and education for children with language development disorders). Her Master's thesis was about 'students asking questions'.
- Harry Stokhof (HAN University of Applied Sciences): his PhD thesis was on research into 'guiding effective student questioning'.
- Ib Waterreus (Ministry of Education, Culture and Science): Senior adviser, Evidence-based Policy.

Five of these experts were physically present at the meeting. Four of them eventually sent their regrets, of whom two sent a written reply to a previously received statement of preliminary outcomes and concerns. The results of the meeting and the written reactions were added to the minutes of the meeting. The results were submitted for the approval of the participants and used for the further elaboration of the report.

From separate studies to final report

After the experts' meeting, the results of the underlying separate studies were checked again and revised or annotated as necessary. They were then collated and described in the present report. This report has the form of an empirically and theoretically supported guide for practitioners and researchers, who are beginning to look for a solution to a still not clearly articulated practical issue. The choice for a guidebook and the limited availability of research sources has the result that not all the answers to the research questions are explicitly stated in the publication.
More specifically, the answers to research questions 1a and 1b on what promoted the analysis of a practical issue and the formulation of a broadly supported research question, can be found in the guide. Question 1c about the contribution of evidence-based actions in practice is answered in a more exploratory and implicit way. We indicate what activities and conditions during the demand articulation benefit the solution of the practical issue and its impact in practice.

Research questions 2 (on differences between and within groups of practitioners and researchers) and 3 (on differences caused by the nature of the issue and whether research is needed or not) are answered in the passages about conditions. There, we discuss the most important competencies of practitioners and researchers, research experiences of practitioners and the nature and complexity of the issue.

A glimpse of the future: possibilities for follow-ups of this overview study

This overview takes a step from 'likely' to a more 'supported' framework for demand articulation in practice-based research. However, it is too soon to speak of 'hard evidence'. The various activities and conditions are theoretically founded but at the same time have the character of a set of assumptions that require testing. For example, this is true of the effect of explicit calls for the presentation of issues and the financing of demand articulation. Recent possibilities for this last point demand further study: what are the conditions, working mechanisms and effects of financing or co-financing demand articulation? The working methods for analysing practical issues and compiling their results have so far not been systematically investigated on their impact. The same applies to reasoning chains as a stepping-stone between the issue and the research question, as well as other components of the process.

The Kennisrotonde (Knowledge Roundabout) is an initiative of the Netherlands Initiative for Education Research (NRO), in cooperation with educational councils (PO, VO and MBO) and the Ministry of Education, Culture and Science.