Introduction: Inquiry-Based Learning - Initial Assessment

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Harald A. Mieg

Inquiry-based learning is a didactic principle in higher education that relies on student independence: learning by conducting their own research. The principle of inquiry-based learning is part of the long tradition of education through scholarship (*Bildung durch Wissenschaft*), which sees academic studies "as participation in scholarship as a never-ending process" (Huber 2009, p. 1, translated). Most institutions of higher learning use the definition of inquiry-based learning developed by Ludwig Huber (2009) as a working definition:

> In contrast to other learning methods, inquiry-based learning is characterized by the fact that learners shape, learn and deliberate on the process of a research project, which is aimed at obtaining insights that are of interest to third parties, doing so throughout all the essential phases of said project; from developing questions and hypotheses, selecting and implementing the methods, through testing and presenting the results, either by working independently or in active collaboration with an overarching project. (Huber 2009, p. 11, translated)[1]

This definition highlights three characteristics of inquiry-based learning: firstly, students should go through the entire research process; secondly, the results should have some degree of value in terms of novelty, and not just for the students themselves; thirdly,

[1] Huber and others used various English translations for "Forschendes Lernen." Besides "inquiry-based learning," we often find the terms "explorative learning" or "research-based learning." For the sake of clarity and consistency, we only use the translation "inquiry-based learning" in this book.

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H. A. Mieg, Prof. Dr. (✉)
Humboldt-Universität zu Berlin, Georg-Simmel-Zentrum für Metropolenforschung, Berlin, Germany
e-mail: harald.mieg@hu-berlin.de

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inquiry-based learning should be conducted independently. All of this raises broader questions, including: what role do professors or lecturers play? How does inquiry-based learning fit into a university education?

Numerous degree programs at German universities and universities of applied sciences have integrated inquiry-based learning into their program. The objective of this book is to provide an initial assessment of these efforts. To this end, we must examine the framework of higher education policy within which inquiry-based learning is currently being discussed. My introduction starts with the Bologna Process, a process which seeks to reform higher education at the European level, and which continues to shape the discussion regarding research today (presented in Sect. 1.1 of this introduction).

As we will see, inquiry-based learning has its own history, which extends back into the period of higher education reforms in the 1960s (presented in Sect. 1.2). Since that time, several variations have developed: there is increased focus on scholarship, as noted in Huber (2009), while at the same time, attention is placed on autonomous learning (Sect. 1.3). I conclude the introduction with an overview of the more than 30 chapters that comprise this book (Sect. 1.4). This will allow us to draw the conclusion that inquiry-based learning is advancing the notion of education through scholarship (*Bildung durch Wissenschaft*) by exploring the learning potential in conducting research or, respectively, in conducting independent research.

1.1 The Bologna Process

The Bologna Process implements the idea of harmonizing European standards at the level of postsecondary education. The objective was to create uniform European standards and thus to increase the mobility of students within Europe (cf. Hanft and Müskens 2005). To this end, the secretaries of education of 29 European countries signed a joint declaration in 1999. The name of the initiative and place where it was signed have immense symbolic significance: the first university was founded in Bologna in 1088.

1.1.1 Motivation, Content, Criticism

Anyone who studied in the 1980s could empathize with the fact that reform was needed. At the time, universities functioned like “educational authorities” where it was possible to stake a claim for a university education. The range of subjects offered at each university location was to be taught at the same level of quality. These were the days of the mass university. Mobility was not encouraged. Many students started in a course of studies at a university to which they had been admitted, and then switched to the city and the course of studies they had dreamed of later. The periods of study were extremely long. Anyone who left university early, after 3, 4 or 5 years, left without a degree in hand. Preliminary

diplomas or interim certificates were of no value, if for no other reason than that they were never intended to serve as a terminal degree.

The Bologna Process is primarily associated with the introduction of the bachelor's/master's system. The bachelor's degree is intended to serve as a professional qualification in a field. The master's degree is a postgraduate degree intended to serve as an introduction to scholarship. The bachelor's/master's system was implemented very expediently in Switzerland. In Germany, fierce discussions ensued within seasoned programs that award a *Diplom*, in particular in the technical fields: a *Diplom-Ingenieur* (someone with a master's degree in engineering) had extensive training in an area, including all subsidiary studies that seemed relevant for potential professional activity. The German *Diplom* could and still can be considered certification for the quality of the academic education.

The primary critique of the Bologna reform, both on the part of the students and on the part of the educators, is the reduction of the degree program to the level of school instruction. While it was previously necessary for students to collect credit certificates for their Course Record Book over an extended period of time, i.e. proof of attendance for seminars or other courses, and then to complete exams, testing occurs at a much tighter pace in the bachelor's/master's system. The basis for this is the ECTS (European Credit Transfer System), a time-based system for recording academic achievements. A bachelor's degree, for example, comprises approximately 60 ECTS, whereby 1 ECTS point is equivalent to approximately 30 h of work. The time expenditure is assessed in such a way that it includes both attendance in seminars and work done at home. Instead of reflection and room for enthusiasm, the bachelor's degree is hectic and a source of exam stress.

1.1.2 And Inquiry-Based Learning?

How does the Bologna Process relate to inquiry-based learning? One of the criticisms is as follows: inquiry-based learning is nothing more than a "repair measure" that would not have been necessary had it not been for Bologna. Old, highly evolved degree programs (in particular those awarding the German *Diplom*) familiarized students with research and scholarship and, at the same time, offered them a great deal of leeway for personal initiative. This is no longer possible within the abridged bachelor's degree program. A likely response to this would be to note that the fact that old study programs that awarded a *Diplom* have simply been shoehorned into a new format has created problems with the bachelor's/master's system in Germany: the intermediate diploma program (*Vordiplomstudium*) became a bachelor's degree program and the primary course of study (*Hauptstudium*) became a master's degree program. As a result, the standard curricula are overloaded with material and there is only a limited likelihood that the degree program can be completed in the projected number of terms. It requires time and patience to get the bachelor's/master's system up and running.

It is often argued that there is simply no time for inquiry-based learning in bachelor's degree programs that have been reduced to the level of school instruction, with

examination practice divided into small increments. In terms of the approach, the opposite is the case: the ECTS points system offers enormous potential to re-evaluate the time invested and in particular, to estimate and foster the value of the individual's own time that they have invested in a course of studies (cf. Sidler 2005). The individual's own time refers to self-organized learning. An ECTS point may comprise 15 h of attending a lecture, for example, as well as 15 h for research and preparation of a presentation (*Referat*). The ECTS system departs from the old system of semester hours per week, which only included the length of seminars or tutorials. The ECTS system makes it possible to create new areas of freedom. In this context, inquiry-based learning once again makes sense.

1.2 A Short History of Inquiry-Based Learning

The notion of inquiry-based learning was developed in conjunction with the higher education reforms of the 1960s. During that period, a series of new universities emerged – such as the Technical University of Dortmund and the University of Bielefeld – and there was a push for democratization, not least because of student unrest. Along with professors, students and student organizations acquired new co-determination rights. The original text on inquiry-based learning, "Inquiry-based learning – scholarly examination" ("Forschendes Lernen – Wissenschaftliches Prüfen"), published in 1970 by the Federal University Assistants' Conference (Bundesassistentenkonferenz), is both enlightening and at the same time, somewhat dismaying: enlightening because the educational issues and the task are depicted with great clarity; dismaying because there appears to have been so little change in the issues with the courses of study.

1.2.1 Reform Initiatives: Project-Based Studies

Project-based studies are a reform idea that is closely associated with inquiry-based learning. In the case of project-based studies, students must complete research projects. Historically, as Huber reports, project-based studies were "expressly brought up and advanced as a critical concept in opposition to inquiry-based learning" (2013, p. 25, translated). Project-based studies were less – or not solely – focused on scholarly understanding, but rather on the impact on social change. Project-based studies were introduced in the 1970s and 1980s in many degree programs, for example in sociology, and soon abandoned again. One reproach that was made by educational planners was that students were not learning enough theory. In sociology in particular, theoretical work is indispensable. It also became clear that many professors used the format of project-based studies to withdraw and actually reduce their teaching load. In project-based studies, it is the students who have to do the work. The University of Bremen has retained and transformed project-based studies; right from the beginning, inquiry-based learning was considered an essential element of project-based studies (Robben 2013).

Experience with project-based studies teaches us two things: Firstly, students cannot be left on their own, but instead require active support and regular feedback; secondly, students need a clear process structure which they can use to orient themselves. There are degree programs and institutions of higher learning that have successfully developed the idea of project-based studies, for example workshops in the field of social work designed to introduce students to current research. What is essential is that such workshops be accompanied by courses that lead students further to their own research over the semesters (cf. Schmidt-Wenzel and Rubel, Chap. 13, in this volume).

1.2.2 The United States: Undergraduate Research

There was a university reform movement in the United States that led to the demand for inquiry-based learning; however, it originated under very different circumstances. The starting point was that the large research universities were receiving too little up-and-coming, research-oriented talent from their own bachelor's degree programs. Unlike the situation in Germany, undergraduate education in the United States is generally not linked to master's degree programs, and professors teach at the master's level, while bachelor's degree programs are organized by other lecturers. A bachelor's degree can be acquired in almost any field of study in the United States; the range of courses is driven not least by the wishes and expectations of the parents who are prepared to pay for the education.

In 1995, the Boyer Commission published a strategy paper regarding the transformation of bachelor's degree programs (1998). The primary and essential demand was: academic studies based on research should (once again) become the standard. The task of research universities should be neither to iron out the shortcomings of students' school education nor to attempt to comply with all of the educational ideas advanced by parents. The Boyer Commission introduced a new standard, one which parents have by now become willing to pay for: undergraduate research – in other words, bachelor's students working on their own research projects. To this end, programs referred to as UROP (Undergraduate Research Opportunities Programs) have been set up at many institutions of higher learning. Through these programs, educators, research facilities or even research-oriented companies can post project proposals for which students may apply. The intention is for research to become a matter of course in a degree program.

1.2.3 Education Through Scholarship and the Bologna Process

For the past 200 years, university education in Germany has been programmatically characterized by education through scholarship (*Bildung durch Wissenschaft*). Critics of the Bologna Process fear a departure from this underlying concept. They claim that the bachelor's/master's system is a frivolous replication of the American higher education system, which is based on different conditions than the German system. In particular, unlike in

England and the United States, German-speaking countries have a tradition of extra-occupational education at vocational schools. The main criticism is the bachelor's degree's explicit focus on employability: education is being made marketable.

Critics, and presumably some university administrators, consider employability to be specific vocational training. It is clear that a bachelor's degree neither can nor should provide this. Employability is better understood as a general employability: Students should be able to define problems and carry out projects, think analytically and present their proposals both orally and in writing. This makes university knowledge accessible in practice.

1.3 Approaches to Inquiry-Based Learning

The discussion surrounding inquiry-based learning is embedded in a broader didactic discussion on an international scale about the connection between research and teaching. As we will see, the emphasis here is on learning (Sect. 1.3.1). The discussion taking place in German-speaking countries focuses on research. Research in inquiry-based learning may refer to scholarship, as per Huber (Sect. 1.3.2) or the Zurich framework (Sect. 1.3.3). On the other hand, research may also refer to personal problem-solving; in this context, research is synonymous with learning from experience (Sect. 1.3.4).

1.3.1 International Discussion: Nexus

Since the 1990s, the motto characterizing the international discussion about instruction in higher education has been "From Teaching to Learning," which was influenced by the article of the same name by Barr and Tagg (1995). The two authors advocate a new didactic approach: move away from thinking in terms of defined courses and instead in terms of supporting and recording learning processes. Barr and Tagg focus on American colleges; however, they refer to higher education in general when they write: "In the Learning Paradigm… a college's purpose is not to transfer knowledge but to create environments and experiences that bring students to discover and construct knowledge for themselves, to make students members of communities of learners that make discoveries and solve problems." (Barr and Tagg 1995, p. 21). According to Barr and Tagg, a change in thinking is needed on all levels – from educators and students to curricula and institutional structures.

Participation in research is one way to shift the emphasis from instruction to learning. With regard to the connection between teaching and research, Healey and Jenkins (2009) made a proposal that has gained a great deal of currency in the international discussion. Essentially, they distinguish two dimensions that shape how to design research-related teaching. The first dimension concerns how actively students participate in a course. This dimension ranges from passive reception to active participation, for example in their own

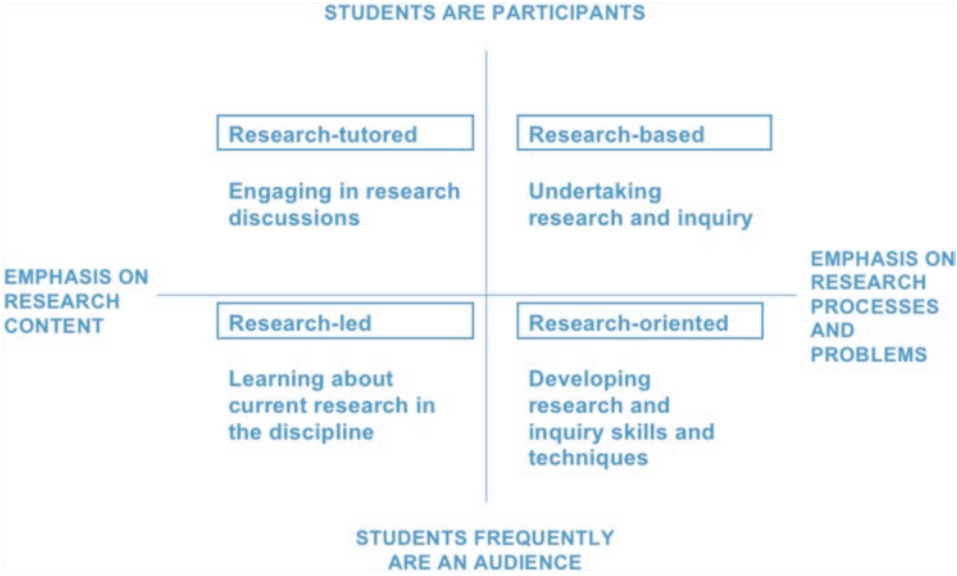

Fig. 1.1 The nexus between research and teaching according to Healey and Jenkins (2009, Fig. 1.1, p. 7). © 2009. Advance HE (formerly The Higher Education Academy). All rights reserved

research. The second dimension comprises the aspect of research on which the course should focus: is it more about obtaining research results, or is the purpose to present and practice the research process?

The intersection of these two dimensions yields a four-field matrix, which is shown in Fig. 1.1. Two fields represent the extremes of research-related teaching: Courses that focus on the introduction of research results, which are referred to as "research-led," are on one side. On the other, we find courses in which the students conduct their own research projects, referred to here as "research-based." These terms carry with them a great deal of potential for confusion: All educators at institutions of higher learning would claim that their teaching is research-based, i.e. based on scholarly research. The other two fields refer to the introduction to scholarly work and research methods ("research-oriented") as well as the subject-based discussion of current research ("research-tutored"). At the Humboldt University of Berlin, a study with a comparable typology has shown that all pure forms can be found in teaching (Rueß et al. 2016).

1.3.2 Research-Related Teaching and Learning According to Huber and Reinmann

Ludwig Huber (2014) illustrates the diversity and blurring of concepts in the field of research-related teaching and learning and proposes a restructuring. This is essentially a tripartite division that extends from "research-based" and "research-oriented" to

"inquiry-based learning." Here, the space set up for students to participate in research is expanding.

1. *Research-based*: According to Huber, "research-based" means that "the teaching and learning is based or founded on research" (p. 24, translated). Regarded as a form of research-related teaching and learning, "research-based" does not simply mean information about research results (that would be "research-led," as seen in Fig. 1.1). Instead, instruction should "provide the student with the opportunity to follow the path of how a question is or, respectively, becomes research" (ibid., translated). This also includes reflecting on the "difference between social problems and the definition of scientific problems" (ibid., translated).
2. *Research-oriented*: Learning and teaching would be referred to as research-oriented if the research process is imparted in a sufficiently strong manner. This should "lead students as quickly as possible to current research or should enable them to begin doing research themselves" (ibid., translated).
3. *Inquiry-based learning*: Here, Huber refers to his definition of inquiry-based learning cited above, and emphasizes the distinguishing trait of independence: conducting one's own research. What is essential is "that the learners conduct research themselves; learning and research coincide in terms of the form of activity: the core of inquiry-based learning lies in the students' own actions" (ibid., p. 25, translated)

Gabi Reinmann used the Huber typology as a proposed model for research-related teaching and learning. As was the case with Healey and Jenkins (2009), the main dimension extends from "students receive" in the research-based mode to "students produce" in inquiry-based learning. Accordingly, the requirements for teaching are changing. According to Reinmann, research-based teaching is about teaching research, while research-oriented instruction is about empowering research and inquiry-based learning is about supporting students in their own research. Reinmann has developed corresponding suggestions for testing (Reinmann, Chap. 9, in this volume) (Table 1.1).

Table 1.1 Pragmatic definitions for the typology of inquiry-based learning according to Huber (2014), with explanations regarding the relevancy to teaching

	Research-based	Research-oriented	Inquiry-based learning
Definition	Learning to understand research	Conducting research	Conducting independent research
Learning	Reception		Production
Teaching	Imparting knowledge	Empowerment	Support

Source: author's illustration, based on Reinmann, Chap. 9, in this volume

Discussion of the possibilities of inquiry-based learning is kindled in particular when the subject is how to design the introductory phase of the course of study. Can and should one expect first-year students to begin their own research projects? In many disciplines, it is argued that students must first acquire a sufficient understanding of the technical basics. This line of reasoning avails itself of the metaphor of scholarship - or sciences - as a building. According to Huber (2009), in the case of inquiry-based learning, a more suitable metaphor for learning would be the growth of a tree:

> If we start thinking of education in the static nature of a building, then of course reliable foundations, et cetera, with sufficient width and depth would have to be laid as a 'basis'; at the same time, these would appear to be 'fixed,' 'unchangeable,' 'able to be clearly delimitated'; only then can what is open, airy, diverse or different superstructures and expansions rest thereon. It is not conceivable, however, that education would be so static, especially nowadays. […] Education – or, better, self-education – can more aptly be described as the growth of a tree that shoots up, extending its branches to different sides and, at the same time, driving its roots even deeper. (Huber 2009, p. 20, translated)

Figure 1.2 depicts the two alternative metaphors for teaching and learning. On the left, we see an image of sciences as a building. At the lowest level, we find basic knowledge. If we think of this as a basement-like foundation, a person would first have to descend to the bottom of the picture when starting university. In-depth specialist knowledge builds on basic knowledge (disciplinary knowledge). On the top floor we find sciences as an enterprise, illustrated here as an observatory. On the right, by contrast, we see the metaphor of the tree, which extends upwards while simultaneously deepening its roots. Applying the image to inquiry-based learning: Through our own research, we are able to deepen our expertise and specialize in a meaningful way at any time.

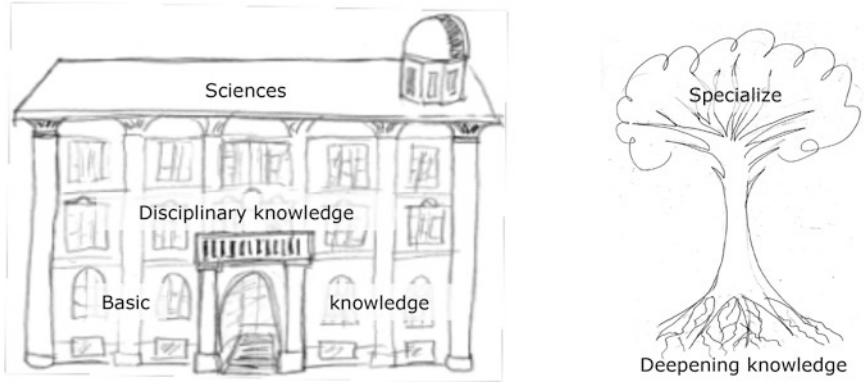

Fig. 1.2 House of sciences vs. tree metaphor for inquiry-based learning. (Source: author's illustration)

1.3.3 The Zurich Framework for Research-Oriented Instruction

The Zurich framework offers an approach for designing and revising curricula and degree programs so that they are research-oriented. The basis for the framework is a model of the research process, which is composed of research activities. Figure 1.3 depicts the research process with its stages in parentheses. The first stage or, respectively, the first research activity is "develop a question," and the second is "examine the state of research." A total of seven stages have been defined. The final stage is "present, explain and publish results." Various didactic issues in terms of proofs of performance, course formats or in conjunction with study programs must be dealt with in connection with a research orientation.

Proofs of Performance Possible proofs of performance are identified at each stage of the research process. These correspond to the products or, respectively, the intermediate products of research. For the first stage – the development of a question – this would be a research paper, for example; for the last stage, the presentation of the results, the proof of performance could be a conference poster. Examples of research products that can serve as proofs of performance are shown on the right in Fig. 1.3.

Course Formats The research activities are linked with course formats. In terms of the research activity, it is now possible to correlate course formats and proofs of performance such as a research paper as a proof of performance for the development of a question in a seminar. Thus even unusual course formats become gained increased significance, for example using a conference as a framework for teaching in order to practice presenting results using a poster. The course formats are listed to the left of the stages in Fig. 1.3.

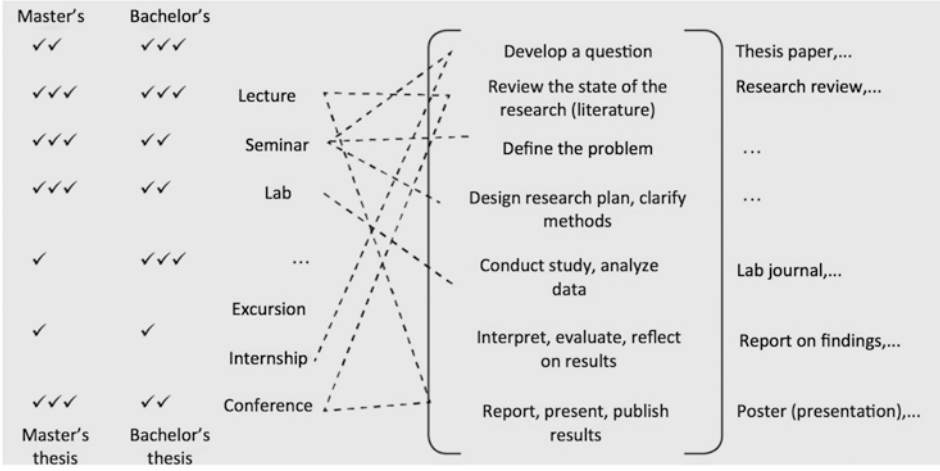

Fig. 1.3 Zurich framework for linking teaching and research (© Prof. Dr. Peter Tremp, Zurich; cf. Tremp and Hildbrand 2012)

Study Programs Curricular anchoring occurs through integration into study programs and study levels, for example in the bachelor's and master's degree. The University of Bremen implemented inquiry-based learning with the help of this model (cf. Schelhowe and Kaufmann, Chap. 33, in this volume).

1.3.4 Alternative Approaches: The Analogy of Research and Learning

In the German-language discussion of inquiry-based learning, the analogy of research and independent learning is sometimes used as an argument. Learning occurs when we perceive something as a problem and look for a solution. It thus depends more on the subjective interpretation of the problem and less on the scholarly derivation of a need for research. The approaches of Wildt (Wildt 2009; Schneider and Wildt 2009) and Ludwig (2011, 2014) are presented below by way of example.

Wildt (2009) or, respectively, Schneider and Wildt (2009) assume that the research cycle is to be understood by analogy with the learning cycle. They define the learning cycle based on Kolb (1984) as a sequence: experience, reflection, formation of a concept, experimentation and the formation of new experience. Accordingly, the research cycle begins with a question that is fostered by practical experience and topic identification. After passing through further stages of research planning and investigation, the research cycle leads to an application and "immersion in practice" (see Fig. 1.4), and then transitions to new research.

For students, the analogy of research and learning means that inquiry-based learning is to be understood as personal development (Schneider and Wildt 2009). An implementation of this approach can be found in art education at Folkwang University of the Arts: The goal and guideline of inquiry-based learning is personal development by means of "experience-based, cooperative and independent learning" (Spelsberg-Papazoglou et al. 2018, p. 5).

For Ludwig (2011, 2014), learning begins with subjective "action problems." Learning and research processes therefore resemble one another: "Because learning processes start with low-threshold action problems, but also with confusion that reaches a crisis (of realization), they are structurally identical to research processes" (Ludwig 2014, p. 12, translated). Learning is about "preserving or expanding our opportunities to participate in the world" (p. 11, translated). Here, Ludwig references Holzkamp (1993): We can only understand learning processes if we take into account the subjective reasons for learning.

Unlike Wildt, Ludwig is less concerned with personal development. Rather, according to Ludwig, the goal of university education is professionalism (Ludwig 2014, p. 8). Professionals "move between demands in practice on the one hand, and theoretical knowledge that their scholarly discipline makes available to them on the other" (ibid., translated). Accordingly, inquiry-based learning means participation in the professional community. Ludwig's approach has gained currency in social work (cf. Schmidt-Wenzel and Rubel, Chap. 13, in this volume).

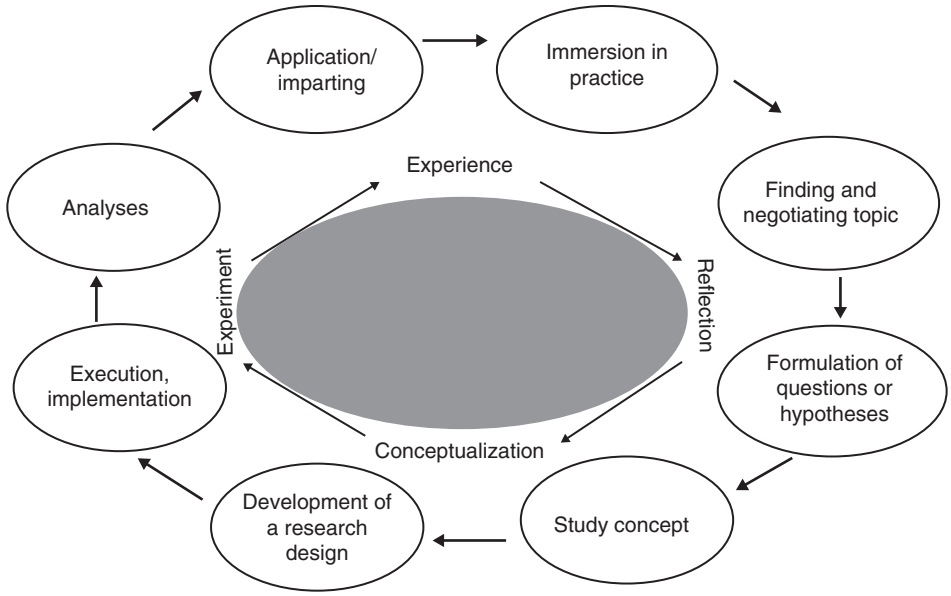

Fig. 1.4 Research cycle with embedded learning cycle. (Source: Wildt 2009, Fig. 4, p. 6, translated)

1.4 This Book, and the Discussion Regarding Institutions of Higher Learning

This book is based on experiences gathered at more than 20 institutions of higher learning. Access to and the implementation of inquiry-based learning is correspondingly diverse. We have structured the book according to three categories of questions.

1. The first is *principles*, which involves the following type of questions: What principles does inquiry-based learning follow?
2. Secondly, *disciplines*, concerning the following question: How is inquiry-based learning implemented in each discipline?
3. Thirdly, *perspectives*, which addresses the following question: What opportunities does inquiry-based learning offer for the development of institutions of higher learning and for society?

1.4.1 Principles

An examination of the principles of inquiry-based learning begins with an introduction from the perspective of higher education research (Pasternack, Chap. 2, in this volume). Peer Pasternack makes it clear that there are very different views on higher education

within Europe, it being more instruction-oriented in France and more focused on general education in England. Pasternack points out the paradox that inquiry-based learning shares with schooling: the desire to foster student independence through a certain degree of compulsion. The subsequent chapters containing basic considerations are subdivided according to specific aspects:

- Learning in inquiry-based learning (e.g. independent learning, a "Shift from Teaching to Learning")
- Research in inquiry-based learning (e.g. developing skills, reflection)
- What does inquiry-based learning mean for the organization of study (e.g. exams, interdisciplinary nature)?

1.4.2 Disciplines

Organizing the section of the book on specific disciplines was somewhat challenging. An obvious solution would be alphabetical sequencing, from A as in architecture, to T as in theology. The presentation would thereby take on the quality of a handbook, and suggest that the user may choose their subjects. Another solution would be to use a traditional classification system of disciplines, for example with the natural sciences on the one hand, and social sciences and liberal arts on the other. But this quickly results in numerous exceptions, e.g. teaching certifications, health sciences or design. All attempts at a complete classification system were unsatisfactory. This failure reveals how dynamic and how diverse subject development is today.

The solution, which we use here, is a hybrid comprising a classification system with sample disciplines, and an alphabetical listing of disciplines that fall outside of this classification system. Not least, the classification system takes this form due to the fact that we wish to take into consideration both universities and universities of applied sciences. We distinguish between four classes of disciplines:

1. Firstly, disciplines for which professional development is an issue and purpose (cf. Dick et al. 2016), e.g. social work.
2. Secondly, the STEM disciplines of science, information technology, engineering and mathematics (MINT in German-speaking countries), because these are the subject of an educational policy discussion of their own.
3. Thirdly, the "life sciences," from traditional medical studies to the newly created field of health sciences. Life sciences enjoy outstanding social significance and attract research funding that is not unsubstantial.
4. Fourthly, art and design, with the three disciplines of the arts, architecture and design by way of example, all three of which are grappling to reach an understanding of research.

The disciplines that are subsequently listed alphabetically include the sustainability sciences, for example. These implement transdisciplinary teaching as cooperation between university and society. Their example teaches us how inquiry-based teaching and learning can be implemented without explicitly referencing the concept of inquiry-based learning.

1.4.3 Perspectives

The final chapters deal with the prospects of inquiry-based learning for institutions of higher learning as well as for the economy and society. The main focus is on higher education development, an example of which being the University of Bremen (Huber et al. 2013; Schelhowe and Kaufmann, Chap. 33, in this volume), not least because of the correlation with the increasing level of heterogeneity among students (Satilmis, Chap. 36, in this volume), as well as new media that create completely new forms of teaching (cf. Hofhues, Chap. 35, in this volume). Unfortunately, what we failed to accomplish was a chapter on inquiry-based learning in continuing education. In general, the image provided by inquiry-based learning becomes blurred as soon as we leave the realm of university education. The question of how companies view inquiry-based learning remains crucial. Companies still appear to be largely unfamiliar with inquiry-based learning.

Finally, a word about inquiry-based learning at universities of applied sciences: Student surveys show that students at universities of applied sciences benefit more from inquiry-based learning than students at universities (cf. Multrus 2012). This may have something to do with the distance of universities of applied sciences to basic research. Critics even claim that universities of applied sciences are simply using the concept of inquiry-based learning to obtain university status. There are certainly quite divergent ideas at the universities of applied sciences themselves: While some believe the future of universities of applied sciences lies in more basic research and the right to award doctorates (much like the technical and artistic institutions of higher learning in the nineteenth century, which gradually developed into universities), others emphasize the special practical relevance, and the responsibility of the universities of applied sciences to teach with reference thereto. A function of universities of applied sciences in our knowledge-based society can certainly be sought in their proximity to the professional field (cf. Mieg 2016). This is because the processing of professional knowledge for the formation of scholarly theory benefits a great deal from practical relevance. In this sense, inquiry-based learning can also be a very helpful tool.

An initial assessment of inquiry-based learning could be summarized as follows: Inquiry-based learning is capable of enhancing the positive aspects of the Bologna Process: promoting independence, reflection and the use of one's own time; taking into account independent learning biographies and lifelong learning in general; as well as a reassessment of the relationship between higher education and forms of research in professional practice. This is accompanied by a redefinition of education through scholarship (*Bildung durch Wissenschaft*), with a university education as noted in Huber (2009) understood to be "participation in science as a never-ending process" (p. 1, translated).

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