PERSONAL THEORY
TOWARDS A MODEL OF KNOWLEDGE DEVELOPMENT FOR DESIGN PRACTITIONERS

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INTRODUCTION

What does theory mean for design practitioners?

In January 2007, The Danish School of Design got the headlines in the Danish newspaper *Weekendavisen*. The news reported concerns a conflict of power: who is to define what kind of theory that is needed in the design fields? This question has been heavily discussed for two decades. Still, no consensus is reached. In order to please political authorities who demand research outcomes in higher educational institutions, The Danish School of Design have employed researchers from academic fields, while teachers of practical subjects are pushed aside. However, research results with little relevance for the professional practices that they ought to serve, have nurtured the criticism of theory skeptics: research and theory building make students able to cite famous theoreticians but useless as professional designers.[1]

This paper aims at contributing to solve this unhappy antagonism between theory and practice. According to the Norwegian philosopher Olav Eikeland, who works on Aristotle (384-322 BC), a closer reading of his texts may contribute to heal the split between academic and practical working traditions. By taking point of departure in the Greek origins of the terms theory and knowledge, the paper outlines a simple model that allows for a development of two basically different types of knowledge and thereby theory within design: 1) personal theory and 2) theory in the academic sense of the term. Personal theory is the theory that practitioners acquire through their work experience and which is proven in practice. It may be regarded a sub theory. Theory in its established form aspires at generalized explanations and understanding that goes beyond personal practice.

The paper outlines various aspects of the concepts theory and knowledge related to practice. In conclusion a simple model offers a

1 "Den grundlæggende konflikt var, hvem der skulle forske i designteori. Skulle man satse på at videreuddanne folk inden for faget, eller skulle man hente akademikere udefra? […] Faren ved at kaste vrag på de håndværksmæssige færdigheder er jo, at det går ligesom hos sygeplejerskerne: Man kan citere Habermas, men man aner ikke, hvordan man lægger en forbinding" (Weekendavisen 2007: 2).

visual representation of the general theory components within design.

THEORY: *Theôría* and *Theôrêsis*

Today's term theory has a double Greek root: *theôría* and *theôrêsis*. *Theôría* means insight and the ability to act right and efficiently in practice, while *theôrêsis* means viewing something from a distance. According to Eikeland, this dual root of theory ought to have given rise to two separate traditions of knowledge and theory building.

Although both categories of theory aims at knowledge, understanding and insight it is a great distinction between practical professions of making something like clocks on the one hand, and speculative hypotheses concerning astronomy on the other. *Theôría* is to be understood as a theory of practice for the practitioner. It may apply as functionalities and rules in making professions, grammar concerning languages, and methodology or logic in scientific contexts (Eikeland 2006: 13-14). According to Eikeland, the projected theory, *theôrêsis*, watching something from a distance and taking a bird's perspective, has been given an exclusive hegemony as true knowledge (scientific), while *theôría* connected to producing practical work fell during history out of the theoretical knowledge categories all together (Eikeland 2006: 16; Gustavsson 2000: 44).

KNOWLEDGE: *Epistêmê* and *Tèkhnê*

Aristotle distinguishes between three principal categories of knowledge: *epistêmê* as true knowledge, *tèkhnê* as technical craft based competence, and *phrónêsis* as the practical wisdom. Only the two first categories will be discussed further.

Today, *epistêmê* is most often translated as scientific knowledge. Eikeland, however, holds that *epistêmê* in its original meaning should be translated as understanding rather than knowledge. In *Theaetetus* (written 360 BC) by Plato (427-347 BC), Socrates asks Theaetetus: what is knowledge; can we answer that question; are wisdom and knowledge the same; and are perception and knowledge the same? After a long dialogue he concludes that: "What seems to a man, is to him" (Plato 2007: 28). From this saying, knowledge is taken to be true, justifiable belief. This is the basis of the scientific understanding of knowledge in the Western tradition, and the teaching of knowledge is called *epistemology* from Greek *episteme* (Gustavsson 2000: 30).

Another kind of knowledge is the one underlying the ability to produce something, Aristotle denotes it *tèkhnê*. When these two knowledge concepts of *epistêmê* and *tèkhnê* were brought into the philosophical discussion more than 2400 years ago, the distinctions between academic and practical work as we know them in our time, did not exist. The two represented different ways of knowing that were useful for separate needs. Aristotle speaks of a reasoned capacity to make:

> … art [Aristotle here speaks of architecture] is identical with a state of capacity to make, involving a true course of reasoning. All art is concerned with coming into being, i. e. with contriving and considering how something may come into being which is capable of either being or not being, and whose origin is in the maker and not in the thing made (Aristotle 350 BC: section 4).

In consequence, experience (Greek *empeiría*) from any proficiency may be developed to become knowledge either in the form of *epistêmê* or *tèkhnê*, dependent on what they concern. This implies that any issue, whether theoretical or practical in today's terminology, if analyzed and described down to its

elementary aspects and set in context, represent knowledge. Accumulated experience from practical work take basically two forms: the ability to perform or skill, and understanding, often called knowledge of confidence (Refsum 2002). The basis for *epistêmê* and *tèkhnê* is the ability to separate between things and acts. The one that could do this and mastered his field was an able master of knowledge; if the topic was theoretical the person was an *epistêmôn*, if it was practical, a *tekhnítês* (Eikeland 2006: 11-14). Both Plato and Aristotle think of *tèkhnê* as knowledge included in *epistêmê*, i. e. as a special type of true knowledge. You have knowledge when you are able to distinguish right from wrong and to explain what you do and why. Knowledge simply means to have insight in something (Gustavsson 2000: 41). However, Aristotle makes a distinction between two types of practical work, the ability to produce and make something new (Greek *poiésis*) and that of just doing anything (Greek *praxis*). This distinction came to disappear during the recent centuries and thereby, practice lost its legitimate place within theoretical thinking (Gustavsson 2000: 44).

THREE KNOWLEDGE CATEGORIES: CRAFTS, DESIGN AND MATHEMATICS

In the Greek Antiquity we find true knowledge expressed in two ways, one for producing practicalities, *tèkhnê*, that implies both the ability to plan and to execute, the other for speculative theorizing, *epistêmê*. In the Middle Ages these three categories of knowledge can be distinguished in the field of building: the knowledge of the crafts persons, the knowledge of the designers, and the knowledge of the mathematicians. When the cathedral of Milan was to be erected in 1390, a disagreement concerning the height of the building arose between the crafts persons and the responsible architect. In order to solve the problem crafts men, architects and mathematicians came together to discuss the matter (Jensenius 2006: 85). In this meeting representatives of three categories of knowledge came together: practitioners who had primary experience and knowledge of materials and building processes, planners who had practical experience, but had moved on to specialize in planning, and theoreticians without building experience, who worked theoretically on mathematics that might have relevance to the applied mathematics in buildings.

TACIT KNOWLEDGE

The fact that practitioners have left almost no written testimony on their trade through history, has led to the notion that practical knowledge is tacit and secret. However, the event in Milan is one exception to the rule. It may be taken to indicate that written sources on practical work lacks simply because they were not necessary to keep professional practices going. The Bristish philosopher Gilbert Ryle (1900-1976) in 1949 spoke up for a new understanding of practice versus theory, of intelligent versus intellectual. According to Ryle, it is a misunderstanding to think that practitioners have a clear understanding of the sequences they are to carry out. He says: "Efficient practice precedes the theory of it […] 'Intelligent' cannot be defined in terms of 'intellectual' or 'knowing *how*' in terms of 'knowing *that*'" (Ryle 2002: 30 and 32).

The Hungarian British scientist Michael Polanyi (1891-1976) built upon Ryle and introduced the term *tacit knowledge* to explain phenomena within the fields of science and everyday experiences of perception. Polanyi addressed contemporary understanding of knowledge. He writes: "I shall reconsider human knowledge by starting from the fact that *we can know more than we can tell*" (Polanyi 1983: 4). He explains how the basic structure in tacit knowing involves two things

at the same time, one that we draw attention to, and another that we disattend. One example is when we make something, then we disattend what our muscles do to focus on the performance (Polanyi 1983: 10). Our true knowledge lies in our ability to use it whether it is language, mathematics or crafting. "This is why mathematical theory can be learned only by practicing its application: its true knowledge lies in our ability to use it (Polanyi 1983: 17). Polanyi intended to explain a general phenomenon he had observed in everyday experiences of perception and his own work within several fields of science. The Swedish philosopher Bertil Rolf sums up the idea of Polanyi saying: "All our knowledge rests on a tacit dimension"[2] (Rolf 1991: 13). Although Polanyi did not speak of practical producing work in particular, it is in these fields that his ideas of tacit knowledge mostly have been taken into use (Gustavsson 2000: 103).

EXPLICIT, TACIT AND INEFFABLE KNOWLEDGE

Know-how is more differentiated than just to be labeled tacit. Scandinavian interpreters of Polanyi have in the 1980s suggested a model of knowledge in which they distinguish three categories: 1) theoretical or explicit knowledge that can be verbally expressed (knowing that), 2) practical knowledge or skill that is learnt through practice (knowing how), and 3) knowledge of confidence that implies and overview and understanding but not necessarily the skill of how to do, within a field (Rolf 1991: 40; Gustavsson 2000: 112). This model may be useful in understanding the activities within making fields (Refsum 2002). Applied on the Milan meeting, one may say that as their principal knowledge the crafts persons had skills of how to mason, the architects had knowledge of confidence of how to plan an erection of a building and the mathematicians had explicit knowledge about abstract mathematics. None of them were experts in all categories.[3] The British Professor of Continuing Education Peter Jarvis has suggested slightly different terms of the same knowledge areas that perhaps may better suit practitioners' understanding. Jarvis distinguishes between content knowledge or *knowledge why* (knowing that), process knowledge or *knowledge how* (knowledge of confidence), and *knowledge how to do* (skill) (Jarvis 1999: 16).

When the late British journalist on craft and design Peter Dormer (-1996) bluntly stated: "Craft relies on tacit knowledge" (Dormer: 1997: 147), he clearly spoke of skills. According to Dormer: "Tacit knowledge is practical know-how, and it exists in people. Consequently tacit knowledge is learned and absorbed by individuals through practice and from other people; it cannot usually be learnt from books" (Dormer 1997: 147). However, this kind of unarticulated knowledge is something completely different from ideas we carry with us almost unconsciously of being human, gendered, incultured in a nation, religion etc. The British philosopher and graphic designer Michael Biggs criticizes the way the concept of tacit knowledge has been taken into use by practical fields. He underscores that the so called tacit knowledge may or may not be tacit dependent on need. If we bother, much of what may seem to be tacit, in the sense that it is not talked about, can be expressed in words, pointed out or demonstrated. Still, there exists really tacit knowledge called ineffable knowledge that stems from experiential feeling, which cannot be put to words or shown even if we tried to (Biggs 2004: 12).

PRACTICAL KNOWLEDGE

[2] My translation from Swedish: "All vår kunskap vilar på en tyst dimension".

[3] The term expert is used in accordance with Dreyfus and Dreyfus ideas (Dreyfus and Dreyfus 2000: 30).

Instead of speaking of tacit knowledge concerning practical work, making and craft, *practical knowledge* as understood from its root in *tèkhnê*, can be more useful. Jarvis defines:

> Practical knowledge is the practitioner's own knowledge that has been legitimated in practice. It is personal and qualitative. Its legitimation is that it works for me, and because it does, I develop my own ways of doing things in accordance with my own values, beliefs and feelings (Jarvis 1999: 46).

According to Jarvis practical knowledge is a combination of several types of knowledge: process knowledge of making (how as confidence, and how to do), content knowledge (making what) and relevant knowledge from academic fields. Jarvis underscores that practical knowledge is practical and not academic or theoretic; it is related to practice situations and integrated in the maker. It is a knowledge that is proven because it works and it has tacit elements that cannot be explained verbally or shown (Jarvis 1999: 44-48).

Taken together we then have four categories of knowledge related to practice that can be distinguished: 1) explicit or content knowledge that can be localized and expressed; 2) process knowledge that includes knowledge of confidence and skill, both consisting of components that can be demonstrated and made explicit, while some parts remain implicit and tacit; 3) tacit knowledge that is unarticulated; and 4) ineffable knowledge of values and beliefs that under no circumstances can be expressed in words or adequately symbolized, figure 1.

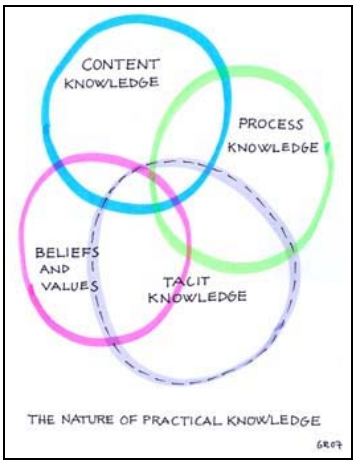

Figure 1 The nature of practical knowledge, after Jarvis (Jarvis 1999: 49).

REFLECTION IN ACTION

In the late 1970s, the US social scientist and consultant Donald Schön sought an alternative to the academic knowledge tradition and started to investigate professional knowledge. He observed among others the interplay between a teacher, Quist, and a student, Petra, in an architect school. Schön registered how the two communicated through sketching, key words and demonstration. The teacher accompanied his student to a solution of her design problem. Their communication, which led to the solving of the problem, Schön defined as *reflection in action* (Schön 1995: 54). Although teacher and student hardly talked together, the communication between them was successful. Schön writes: "His [Quist's] talk is full of dychtic utterances – 'here', 'this', 'that' – which Petra can interpret only by observing his movements" (Schön 1983: 81). This communication was not tacit, nor verbal, but based on visuality and body movements. It was a rational discourse executed through drawing and gestures (Schön 1995: 82-87). This example shows how the knowledge types of confidence and skill that by many would be categorized as tacit, are expressed and communicated; they are neither tacit, nor ineffable.

RETROSPECTIVE REFLECTION
Practitioners reflect in action, but they also reflect before and after they act. Studies show that retrospective reflection is essential in learning. Especially when we learn something new, we are analytical in our approach. We cleverly think about what we are going to do, concentrate while trying to do it, and reflect through the process afterwards in order to secure that we did the right thing or become aware of what actually happened. When we master for instance to swim, drive a car or execute our practices, and do it professionally, we act merely automatically or intuitively (Dreyfus and Dreyfus 2000: 50). However, when something goes wrong, even the expert will start pondering on the sequence of events in order to explain the failure. If a reasonable explanation is found, the failure may be explained. This understanding gained can be integrated individually or within a field as a new knowledge that may help us perform better and avoid similar incidents in the future (Petroski 1992). At all stages of professionalism practitioners may benefit and learn from evaluating their performance. Through retrospective reflection practitioners become aware of their actions and acquire more practical knowledge in the form of knowledge of confidence, which is their own. The result of this kind of reflection will help them plan and predict for future events (Jarvis 1999: 70).

PERSONAL KNOWLEDGE Accumulation of the knowledge that arises from retrospective reflection on personal experience adds to the individual's personal knowledge base from which one later can draw. It is the totality of our practical knowledge stored that helps us act in new practice situation. Even if this kind of knowledge is called personal it is culturally embedded and thereby shared and recognizable by others. Rolf says: "Personal knowledge is a unity of tradition and subjectivity in one person" (Rolf 1991: 96)[4]. This means that personal knowledge goes beyond the merely subjective. It consists of personal practical experience that is related to the tradition of the field in question, which is commonly shared. Concerning skills one may say that skill is tradition perceived by the individual. Skill is acquired by reflective practice, which is embedded in tradition. You cannot become a good practitioner on your own; you learn it from somebody, but you have to master it on your own.

PERSONAL THEORY OF PRACTICE AND PERSONAL THEORY
When practitioners reflect on their personal practical knowledge they acquire an overview of their practical work, which is a theoretical understanding of their work, i. e. a personal theory of practice. To this theoretical understanding based on learning from practical experience, they add all kinds of knowledge and information from other sources that they have accumulated in their lives, including academic theory. Taken together, this abstract thinking constitutes their personal theory. A personal theory is individual, personal and subjective. It arises from within the practitioner's experience and is pragmatic and dynamic directed to previous and future practice situations. But as with the personal knowledge, the personal theory concerning a field of competence is constituted by its shared education, rules, attitudes, information sources, and social and personal relationships. One practitioner's personal theory cannot be entirely different from that of other practitioners' in the same field. What is subjective in the personal theories will be the conglomerate of knowledge that is accumulated and how this knowledge is used and accented according to the individual

[4] Swedish: "Personlig kunskap är en förening av tradition och subjektivitet innom en person", my translations.

practitioner's interests and aims. Personal theory is not the same as theory of or about practice that is general and informative. Jarvis defines: "Personal theory consists of fully integrated knowledge that combines learning from doing and thinking about practice with learning from other information sources" (Jarvis 1999: 145), figure 2.

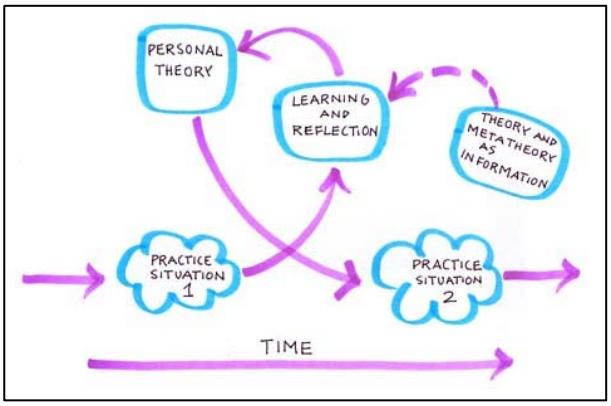

Figure 2 The relationship between practice and personal theory, after Jarvis (Jarvis 1999: 134).

From the model is seen that a personal theory grows through a sequence that can be modeled in four principal steps. It starts in 1) the work situation in practice; continues with 2) retrospective reflection; goes on with 3) adding information from sources outside the practical situation, and ends 4) by integrating the new understanding gained, which then becomes new knowledge that adds to the personal theory and can be tested in new practice situations. Then the loop revolves again.

RESEARCH

According to the model presented, practitioners may acquire new knowledge in two different ways: 1) by retrospective reflection on personal practice and 2) by information from external sources. When new information is actively sought, practitioners have to look for it outside their personal practice. This is a task of *theôresis*, of overlooking and finding relevant information outside the personal practice. Such an activity implies an inquiry. An inquiry can be shallow or deep, done at random or systematically. The systematic inquiry may grow to become a research project. One reason why practitioners start doing research work is expressed in the book *The Craft of Research* saying: "Most everyday research begins not with finding a topic but with confronting a problem that has typically found you, a problem that left unresolved means trouble" (Booth, Colomb and Williams 1995: 49).

Many design tasks are complex and difficult, or even impossible, to solve adequately without extensive information gathering. Sometimes, the information gathering process does not lead to the expected outcome. If designers need an answer to a particular problem in order to continue to design, they may have to find out for themselves. Booth and Colomb's model shows how a practical problem motivates the research question that defines the research problem, which finds the research answer that helps solve the initial problem. Then the design process may be carried out successfully, figure 3.

Figure 3 Practical problems generate research problems (after Booth, Colomb and Williams 1995: 49).

However, research may for design practitioners represent a detour from their design work. It certainly takes something to get research training, competences and skills, and to work out the research. The aim of research is to contribute to create new original knowledge that is shared within a community (Friedman 2003: 509).

ALTERNATIVE DESIGN APPROACHES

Designers may apply several approaches to their design tasks and work differently, figure 4.

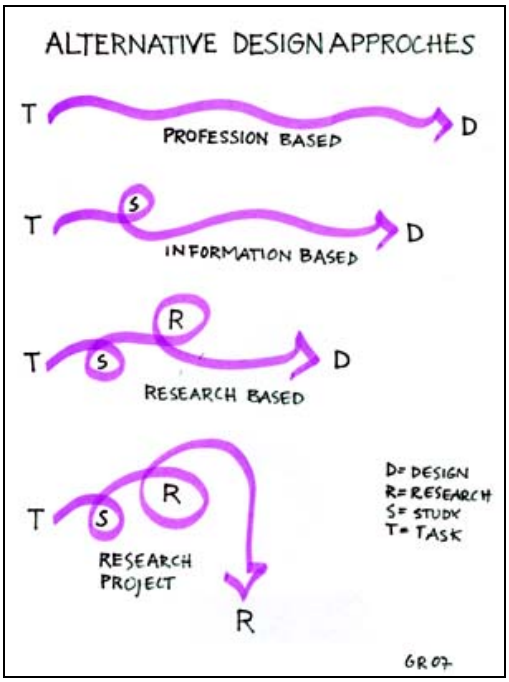

Figure 4 Alternative design approaches

The most common, professional way of working as a designer is to further the tradition into which one was trained. The professional practice is developed in collaboration with colleagues through work, social events, published material, including research outcomes, and the field's associations.

Another way of working includes a more active information gathering and study than the first, indicated by the curl called s in the model. This approach has an explicit continuous-educational-attitude built into the design process. The line in the model is drawn shorter than in the first approach since the studying attitude by necessity takes time. In the third variety a new curl called R, standing for research, is included. The line is substantially shortened because research takes time away from the practical design process. However, this approach may constitute a research based design process adequate for certain complex tasks that cannot be solved without research. As such it is as efficient as it could be. In addition, a research based design process generates research outcomes in addition to the design result. Finally, some designers become so engaged in research that they continue to do research and leave their design practice. They still operate within the design field and have an understanding of practice.

DESIGNER'S THEORY DEVELOPMENT

If the relationship between practice and personal theory as modeled by Jarvis in figure 2 is combined with the alternative design approaches as shown in figure 4, a new model may be constructed, figure 5.

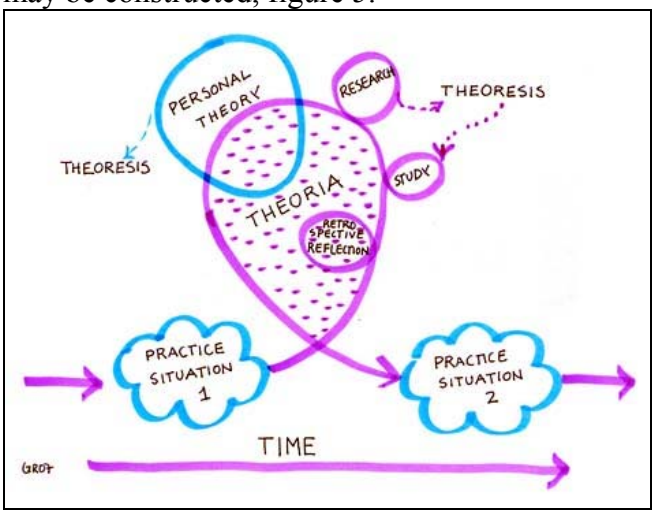

Figure 5 Designers' theory development

In this model the area of the big curl represents *theôría*, personal insight, while the

field outside the curl is seen as *theôresis,* all kinds of theory and understanding. Moving from practice situation 1, the inwardly directed curl, called rr, that stands for retrospective reflection. This curl may be small, big or non existent. The same applies to the next outwardly directed curl, called s, that represents study. It is drawn outside the field of personal insight to indicate that information is found in the external field. Thereafter, comes the bigger outwardly directed curl, labeled R, for research. It is bigger to indicate that this task is more demanding than the study. The R curl is connected to practice and the insight area, but is enclosed in the *theôresis* field. The arrow pointing outwardly indicates a theory outcome that adds to the external, *theôresis* field.

The efforts of the various curls become integrated in the compartment of personal theory, which is one of continuous expansion. It consists of two parts, placed on both sides of the line of the personal insight area. The line indicates that the personal theory consists of two kinds of knowledge: 1) *theôría*, practical insight and abilities and 2) *theôresis*, explicit knowledge. From the personal theory area is drawn an outwardly arrow, which indicates that some of the personal theory can be communicated into the *theôresis* field. It adds in its *tèkhnê* form to *epistêmê*, the general knowledge and theory that exist.

CONCLUSION

What does theory mean for design practitioners?
It means:

1) personal insight (*theôría*), as the awareness of personal actions and reflections in practice
2) general information (*theôresis*) that is gained through research
3) personal theory that combines insight (*theôría*) and general information (*theôresis*).

In a well developed form the personal theory is the guaranty of *tèkhnê*, the professional understanding of a subject, which is partly personal and partly embedded in the broader and general concept of knowledge that is *epistêmê*.

All practitioners have their personal theory of practice. The personal theory consists of both articulated and non articulated knowledge in various degrees, the first to be discussed, the other to be demonstrated in the work. It remains open to what degree practitioners want to extend their personal theory, in what way – more retrospective reflection, more information seeking and studying, or more research – and at what times in their careers. All the same it may be useful to have a visual map (*theôresis*) in which designers' work may be understood. However, no part of the model is the more valuable to the practitioner than the bottom line: the practice.

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