

PRACTICAL KNOWLEDGE AND MEASURABILITY IN EDUCATION

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Abstract

This paper argues that contemporary education policy standards face with an internal contradiction within their requirements. First, these standards make an emphasis on practical knowledge, or as often called, knowing-how. Second, they also imply quantitative measurability in terms of effectiveness and applicability to out-of-school requirements. I shall argue that these two (and separately reasonable) requirements contradict to one another, and hence they cannot be satisfied at the same time. The best education theorists and policy makers can do is finding a suitable balance between the two.

1 Introduction

Providing up-to-date, practical knowledge seems to be a general requirement for economics education in Hungary. Out of twenty-two higher education institutes having an educational profile similar to the newly founded Faculty of Economics and Business of John von Neumann University (Kecskemét, Hungary), only a few lacks an emphasis on “practical”, “up-to-date” knowledge in their mission statements (check their institutional websites). It seems self-explanatory that the exceptions need not develop a fashionable self-image because of their reputation on the one hand, and/or have no clear marketing strategies on the other. But programmes and institutes in a need of good marketing echo the same few buzzwords across the national higher educational scene (and probably beyond), all centred around practicality, job market orientation and timeliness.

From a marketing/communication perspective, this phenomenon demonstrates a lack of original self-image of many of these institutions. But the focus of this paper is different, intending to indicate a much deeper and more general problem occurring within the educational practice of *any* institution offering practical, up-to-date knowledge and skills. The problem is that practicality, perhaps paradoxically at first sight, contradicts with a deeply anti-theoretical (called, somewhat misleadingly, as ‘practical’) approach to education that is no less fashionable, and its application is no less expected from educational institutes than (genuine) practicality itself.

The approach often referred to as ‘managerialism’ requires education to be evaluated in terms of measurable investment and measurable outcome, efficiency (as the central requirement in the equation) being the ratio between the two. Investment and outcome are to be understood primarily in market terms: “managers are accountable for what they deliver, but not for how they deliver it. It is results, not methods that count” [1]. Hence, for managerialism, educational practices are purely functional, serving economical aims like training educated workforce rather than intellectual “self-indulgence” and “self-absorption” [2] like having students educated for the pure sake of *being educated* as a value in itself.

Managerialism is often charged with being insensitive to the internal needs of proper education. Arguably, academic freedom suffers much from the requirement that academic activities

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partly or fully should be measured in financial terms [3]. Many 'outcomes' of education are simply unmeasurable in financial terms; e.g. going through a morally enlightened education essentially differs from a practice-oriented, functional training that aims only at applying (rather than examining) knowledge. Morally enlightened education helps students living a good and valuable life but how it can be converted to market values is questionable at the very least [4]. It can be also argued that proper application requires much more than what is provided by measurable outcomes; it simply cannot be properly measured how graduates will be able to apply their knowledge to *yet unforeseen* circumstances, and this is a huge factor in their knowledge's being *practical*.

Whether the argument that education can or cannot be properly evaluated in input-output relations is not an issue here. Despite all criticism, a managerialist approach to education is the ground for a generally (even though often implicitly) accepted contemporary educational policy in many countries, including Hungary. Here this condition is taken to be a fact that defines the elbow room for the discussion. The issue discussed in this paper is that being practice-oriented and being managerialist in education are two incompatible positions, implying two directions that cannot be followed at the same time. Even if a choice between them is perhaps not a yes/no question, they mutually weaken one another, and hence an appropriate balance has to be developed between the two.

2 Methodology and conceptual framework

Practical knowledge (often simply called as 'know-how' or 'knowing-how') is a notion widely discussed in the education theory literature. It is closely related to (though certainly not synonymous with) popular conceptions like active learning, knowledge by participation, knowledge construction etc. Knowing-how used to be contrasted with knowing-that, the first being practical and directly applicable to mundane problems, the latter being theoretical or factual and applicable to abstract problems only. It is a general attitude in contemporary education policy that the emphasis needs to be put onto educating applicative, effectively useful, and hence practical knowledge. Educating theoretical knowledge should be restricted to higher levels of education where, as a path towards academic careers, it can be useful. For training workforce, even at higher levels, it is claimed to be much less effective.

Anyway, disregarding factual knowledge is not a novel idea by far. An educational model focusing purely on educating knowing-that was first criticised by Plutarch in the 1st Century A.D. on the ground that students' minds are not to be seen as empty vessels to be fulfilled with the water of knowledge by the teacher but rather they need to be supported to be creative at the first instance [5]. Having theoretical or factual knowledge may or may not be a contributive factor to creativity; however, it is certain that creativity has something to do with application and hence practical knowledge. It is also a commonplace that for other than academic purposes, knowing-that is much less effective than knowing-how. Education, traditionally seen as transmitting theoretical knowledge, is a misleading enterprise, so the argument goes, because it is ineffective for training non-academic workforce (i.e., the majority of graduates) that is supposed to face mainly with mundane problems to which practical rather than theoretical knowledge applies.

This makes the notion of knowing-how especially important for education theory and practice in the context of managerialism. The contrast between knowing-that and knowing-how defines the distinction between (allegedly) old-fashioned conceptions of how education should work and innovative, practice-oriented approaches. But as I shall suggest, there is there is a conceptual problem within the educational framework of practical and measurable knowledge at the same time. This problem may be apparent for a philosophical but not necessarily an education theoretical investigation, precisely due to its conceptual nature.

My attempt in this paper is drawing conclusions from philosophical insights that may be worth to consider for education theorists and practitioners too. Its purely philosophical methodology may make it seem as obscure and speculative for (social) scientifically minded readers. For this reason, a note on the possible implications of conceptual analysis as a methodology may be important here. First, it is not implied that conceptual analysis can replace empirical research. Whether a certain standard works in the educational practice or not is an empirical question, and hence it must be

tested empirically. Consequently, no conceptual analysis can (or should) provide arguments for the application of educational standards. Second, conceptual analysis can nevertheless provide arguments *against* the application of some standards: if the conceptual framework on which a set of standards rests has an internal conceptual contradiction, by means of pure logic, it *cannot* work in practice. So even if conceptual analysis cannot serve as a verification of the applicability of educational standards, it can be suitable for serving as a falsification of that. Conceptual analysis provides no room for testing educational standards; it can provide, however, an anteroom for tests. Educational standards passing conceptual analysis may or may not work in practice; but educational standards failing conceptual analysis would necessarily fail practical tests too.

As a framework for the analysis, I shall rely on a current debate on knowing-how in contemporary analytic philosophy of language and epistemology. A common ground in debates about knowing-how is that it can be best characterised in its relation to knowing-that *and* abilities. In these debates running approx. from the middle of the last century and revived around the millenia, knowing-how is not only contrasted with knowing-that but also with abilities or skills: knowing-how is practical (in contrast with knowing-that) but also knowledge-like (in contrast with pure abilities). The predominant view since Gilbert Ryle's famous attack against the view that knowing-that is reducible to knowing-how is that knowing-how at least partly differs from knowing-that due to its essentially practical character [6, 7]. Arguably, it also at least partly differs from abilities due to its cognitive, i.e., knowledge-like character which abilities generally lack [8].

The first contrast seems to be rather trivial after Ryle: knowing-that is propositional knowledge like knowing the proposition *that* 'the battle of Hastings was in 1066'. In contrast, knowing-how is knowing a way *how* something is to be done – e.g. knowing how to ride a bicycle. This sort of knowledge, in contrast with knowing-that, is at least not *trivially* propositional. With no doubt, knowing-that presupposes some knowing-how: knowing the proposition above presupposes that the knower knows how propositions like that are to be understood. These instances of knowing-how are, however, *irrelevant* regarding the concrete item of knowing-that in question: understanding propositions has nothing relevant to historical battles (but relevant to understanding propositions referring to historical battles). Similarly, knowing-how also contains some knowing-that: as many argue, knowing how to ride a bike means that the knower also knows some *relevant* propositions like "*this and that* is a way of riding a bike", where '*this and that*' is a complex description of riding a bike [9].

A reason behind the claim that knowing-how contains *relevant* knowing-that but not *vice versa* is that noone would be happy to accept that e.g. chimpanzees *know* how to ride a bike. Animals other than humans do not have *knowledge*, even not of practical kind. Even if a chimpanzee *can* ride a bike (i.e., she can develop an ability or a set of abilities that makes her able to ride a bike), she does not have a *knowledge* how to ride a bike. Note that the question whether apes can have some limited sort of knowledge or not is irrelevant here: there certainly is a level of mental development of animals where there is a consensus that they cannot have knowledge in any sense, though they can have relevant abilities. E.g. flies *can* fly but it would be odd to say that they *know how to* fly, or some amoebae *are able to* pathogenically infect other organisms but they do not *know how to* infect pathogenically, as knowing-how presupposes cognitive capacities that a fly or an amoeba does certainly not possess. From this, so-called intellectualists in the debate on the status of practical knowledge conclude that knowing-how is closer to knowing-that than abilities [10]: knowing how to ride a bike is knowing *that* 'this and that' is the way of riding a bike (where 'this and that' is a complex description of riding a bike).

The argument above demonstrates that 'can' does not imply 'know-how'. It is also arguable that 'know-how' does not imply 'can'. A ski instructor can teach some of her most talented students to perform a complex trick that the instructor herself cannot perform. It seems to be intuitive to say that she *knows how to* perform that trick, otherwise it is hard to explain how she can teach it [11].

Anti-intellectualists (holding that knowing-how is closer to abilities than knowing-that) normally respond to intellectualist arguments by claiming that knowing-how is not *reducible* to knowing-that. An item of knowledge *that* 'this and that' is the way of riding a bike, so they argue, is not identical with the knowledge *how to* ride a bike. Even if someone has the knowledge(-that) to describe the way of riding a bicycle in every single detail from balancing to rolling the pedals at the level of basic bodily movements, we would not say that she knows how to ride a bike if she never tried to actually

ride a bike. It is simply absurd to say that someone knows how to ride a bike e.g. only from reading books about bicycle riding as there is nothing *practical* in that sort of knowledge of her.

Taking a side in this debate goes far beyond the scope of this paper. But as can be seen even from this brief summary above, there are good reasons to take knowing-how to be distinct both from knowing-that and abilities or skills. A standard strategy of debaters is typically not to provide arguments for their view but to provide counter-arguments against the opposing view: with a few exceptions, intellectualists argue why knowing-how cannot be reduced to pure abilities, and anti-intellectualists argue why knowing-how cannot be reduced to knowing-that. This seems to be fairly reasonable, insofar as knowing-how is both practical and cognitive, whereas knowing-that, even if cognitive, is not practical, and abilities are, even if practical, not cognitive. Being identified as following a reductive strategy (to either direction) is often seen as an objection to the view in question precisely because the picture is certainly more nuanced than a pure opposition would suggest [12].

The most important consequence of this debate to the present topic is as follows. When educational standards are to be set in order to emphasise the importance of educating practical knowledge, a contrast with theoretical knowledge alone is insufficient. Knowing-how must also be contrasted with abilities or skills. An ability to solve a problem does not imply knowledge how to solve that problem; and if so, it is questionable whether that ability can be *intentionally* applied to yet unforeseen problems, just like in the case of animals that can do something even without knowing how they do so. The sort of reflexivity characteristic about knowledge is required to *extend* abilities beyond the scope of learnt situations: understanding (1) why a certain method works in a certain situation, (2) how one situation differs from another, and consequently, (3) how the method that worked well in the first case should be applied, or even modified if necessary, to the second case is what makes practical knowledge to function at its best.

Educational standards aiming at effectiveness in terms of future employability must take this difference between pure abilities and knowledge-how into careful consideration. In an ever-changing reality of the present age that strongly requires individuals to be lifelong learners, an adaptability to unforeseen situations and an application of previously gained knowledge to newly emerging problems are essential for being successful on the job market. If education offers 'transferable skills' but no guidance on *how* skills should be transferred, its offer is hardly more effective than offering inapplicable factual knowledge only.

3 Knowing-how and measurability

The claim of this section is that measurability standards (central to managerialist criteria) cannot be applied to practical knowledge. The above-mentioned problem of applying knowledge to unforeseen situations (that is so typical about practical knowledge) makes measurability impossible: precisely because these situations are unforeseen, knowing-how is not subject to a once-and-for-all finalised assessment. If practical knowledge can be measured only at its limited application, what is measured (and hence warranted by education) is not genuine practical knowledge, or at least not practical knowledge at its best.

Measurability seems to be simple in the case of abilities. Assessing one's abilities to do something is answering a yes/no question whether one is able to do so or not. It seems to be a simple factual question whether one is able to ride a bike, whether one is able to do a triple salchow, or whether one is able to learn when the battle of Hastings was. There are some more complex cases when the subject makes the answer to be less trivial; e.g. whether one is able to cook a good goulash or whether one is able to win a chess tournament. But the complexity of cases like these has nothing to do with the bivalence of the answer. It is up to certain (perhaps at least partly subjective) standards what makes a good goulash, but once the standards are fixed, whether one can cook a good goulash or not is unambiguous. Whether one can win a chess tournament partly depends on the abilities (and preparation, actual form, etc.) of other participants, but once her abilities are suitably compared to the others, it is unambiguous whether she has a real chance to win the tournament under normal circumstances. It can even be said that she *could* have won the tournament even if she did not win, as long as her abilities are very good in comparison with the abilities of her contenders.

Factual knowledge is also well measurable because of its propositional character. Whether one knows when the battle of Hastings was is a yes/no question that can be assessed even in the most primitive forms of assessment (e.g. a simple 'one question – one answer' form or a multiple choice question). Complex theoretical knowledge does not differ qualitatively from simple factual knowledge like the Hastings example: insofar as knowing-that is taken to be entirely propositional, complex instances of it are nothing but complex propositional phenomena. In other words, the complexity of theoretical knowledge is originated primarily from quantitative rather than qualitative characters of knowledge items, e.g. their length (how many propositions they consist of) and structure (how complex logical relations are among its constitutive propositions). Where qualitative difference occurs in knowing-how, it affects cognitive abilities. The understandability of a certain proposition is certainly a qualitative characteristic of the proposition but relates to the cognitive ability of understanding that proposition rather than the knowledge of the proposition itself.

Whether one is able to understand a complex set of propositions (a postmodern novel or a scientific theory) is perhaps less measurable than measuring whether she can answer factual questions about it. But understanding is not a constitutive part of knowing-that but a *preliminary condition* of it. Simple question-answer tests cannot evaluate understanding properly unless they focus on inter-propositional connections and context. But still, questioning intra- and intertextual relations of propositions can provide an approximation of one's understanding of a complex set of propositions. Its accuracy would largely depend on how the complexity of the text relates to the complexity of textual connections questioned, but if their ratio is high enough, it would relatively well indicate how one understands the present paper by answering questions like what is the relation between managerialism and the education of practical knowledge; how Ryle's view affects measurement problems in education; or what position this paper implies in contemporary educational policy debates. Probably it could not be done in the form of simple questions and simple answers but in essay-like forms. All the same, an expert on these matters with some university teaching experience could probably well judge a student's level of understanding of this text on the basis of her answers to these questions.

Note that even if such an assessment works relatively well, it still misses to satisfy managerialist criteria. Assessment in cases like this is, and can, not standardised enough; even if different experts would probably judge the same learning outcome similarly, there is no objective warranty (like quantitative measurability in the case of tests) for the uniformity of evaluation. Even if a detailed scoresheet is developed that assigns scores to different aspects of the answer (e.g. clarity, structure, strength of argumentation etc.), there is always at least a slight subjective factor in evaluating the answers because the corresponding questions are not yes/no questions that are subject to clear and unambiguous evaluation.

For this reason, let managerialism be more permissive towards expert judgment and suppose that it allows for experts to judge, on relatively (rather than absolutely) objective grounds, the quality of answers whenever quantitative assessment is not possible. After all, marking essays is a living practice in education, and institutes missing this form of assessment does so rather due to resource issues like a low teacher-student ratio implying an unacceptable amount of teachers' working hours to be spent on essay marking than on the ground of programmatic issues like a lack of objectivity. Let managerialists accept that essay marking fairly measures a number of qualities a student can demonstrate; most of them relating to 'soft' or 'transferable' intellectual skills relevant for essay writing like interpretation, argumentation, analysis, understanding concepts, structuring lines of thought, presenting ideas etc. But even in this scenario, practical knowledge in the form of application and adaptability, i.e., knowing-how at its best, remains unmeasurable. The bad news for managerialists is that if practical knowledge as application and adaptability cannot be measured by quantitative standards, employers will not find some of the most wanted 'skills' in assessment histories of graduates.

The reasoning goes as follows. Knowing-how is usually, but in my view mistakenly, taken as 'knowing how to F (where F is a predicate referring to some activity). I take knowing-how 'at its best' to be much more general than assigning well-defined predicates to the relevant practical knowledge to it. Knowing-that is in my view reasonably discussed in the form of 'knowing that p ' (where p is a proposition). Propositions are the basic units of knowing-that; they are discrete, well-identifiable and well-circumscribed. Abilities are also reasonably discussed as 'an ability (or a set of abilities) to F .

Though abilities are less suitably characterised as discrete entities (that is the reason why the alternative modification is added in the brackets), they are also unambiguously decidable. As argued, it is always a matter of clear yes/no question whether one is able to *F*, regardless of what predicate stands for *F*. But following the intellectualist – anti-intellectualist debate regarding the nature of knowing-how, it is far from unambiguous what conditions can be given to decide whether one knows how to *F*. Let me demonstrate this ambiguity by two examples taken from the above-mentioned literature.

The first example states that no figure skater has even done a quintuple salchow (which is a well-describable figure skater jump). Intellectualists argue that if anyone, the world class figure skater Irina Slutskaya, one of those who have ever performed quadruple salchows, knows how to perform a quintuple salchow, even if she is not able to perform one. A main reason is as follows. Consider semantic intuitions about (a) 'Irina knows how to *F* but she is unable to *F* and (b) 'Irina knows how to *F* and she is able to *F*. If knowing how to *F* were equal to an ability to *F*, (a) would be internally inconsistent and (b) would be redundant. But the attribution of Irina's knowledge how to *F* is both cancellable (as in (a)) and reinforceable (as in (b)) by the attribution of her ability to *F*. It is meaningful and informative to say that Irina knows how to do a salchow but she is unable to perform one, and it is also meaningful and informative to say that Irina does not only know how to do a salchow but she is also able to perform one. Hence, knowing how to *F* does not entail an ability to *F* [13].

Second, consider a famous pianist who was playing Bartók's *Allegro Barbaro* several times in the greatest concert halls worldwide. She clearly knows how to play the *Allegro Barbaro*, and she used to play it frequently. However, in an unfortunate accident, she loses her hands. Now she is unable to play the *Allegro Barbaro* (or any other music piece), but it would be odd to say that she does not know how to play it, as all what she lost is her ability to play, but not her knowledge how to play the *Allegro Barbaro* (unless we suppose that her knowledge was stored in her hands). She could obviously demonstrate her knowledge how to play the *Allegro Barbaro* e.g. by pointing to good and bad performances presented by other pianists as well as her earlier performances with detailed explanations [14].

These examples are interesting because they apply arguments to show that 'knowing how to *F* does not entail 'being able to *F* by referring to cases of experts who are, or were, *very much able* to *F* or do *F*-related activities. This suggests that knowing-how is even much less graspable by a reference to discrete items than abilities: while knowing-that is discrete, an ability or a group of abilities can also be taken as discrete, but to knowing-how, past abilities (the pianist was able to play the *Allegro Barbaro*) or related but not directly relevant abilities (like being able to do a quadruple salchow is relevant for being able to do a quintuple salchow) can contribute. This implies knowing-how to be a capacity measurable only on a large (and hardly definable) scale: it can be the case that one is to be assessed as knowing how to do a quintuple *on the ground that* she is able to do a quadruple or it can be the case that one is to be assessed as knowing how to play a music piece *on the ground that* earlier she was able to perform it (but she would not be able ever again). Assessing that one can or cannot do *F*-ing does not imply that she does or does not know how to *F*, and the latter would be more relevant for performing well in similar situations in the future than passing or failing in exam situations that are artificial anyway.

4 Conclusion

Practical knowledge, insofar as it is taken to be large-scale evaluable due to its applicability and adaptability, cannot be measured by managerialist standards. Since these standards take measurability and practicability to be two cornerstones of innovative education, the relation between these requirements has been aimed to be clarified. Conceptual analysis shows that they are incompatible: if learning outcome should be well-measurable quantitatively, practical knowledge does not fit into learning outcome. Still, practical knowledge is preferable to theoretical knowledge by managerialist means for good reasons. The task for the managerialist approach is therefore to find a good balance between practicality and measurability because, despite their suggestions, the two do not support each other but on the contrary: practical knowledge cannot be measured and measurable learning outcome is either not knowledge or not practical.

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