Triple Peer Review – Developing a New Peer Review Process in the Context of the Educational Sciences

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0. Introduction

Despite criticism, doubts, and ambiguous empirical evidence regarding how well it achieves its intended goals, there is no alternative to peer review in science (Simon & Knie, 2007, p. 26; Bornmann, 2008, p. 23). Indeed, as a result of accreditations, excellence initiatives, and third-party research financing, the importance of peer review is increasing and it is more and more often a factor that decides over destinies and careers, over reputations, renown, and awards in the scientific system (Fischer, 2004, p. 28). A journal article that has passed through an acknowledged peer review process has become a status good: According to Münch (2010, p. 343) such goods are first and foremost desired because of their symbolic value, that is: status good touches on exclusivity. Exclusivity becomes possible when one restricts or even refuses access – as is the case with the scientific publication system and peer review.

This article considers the topic of peer review in the context of publishing in scientific journals and describes the development of a peer review model for an educational sciences journal with a methodological focus. The article is divided into three sections: in Section 1 I briefly explain the importance and characteristics of, problems with, and findings about the use of peer review in science, particularly in the system of scientific publishing, in order to create a *framework* for the development of the model. My own experiences while searching for solutions to the challenges posed by various peer review processes in the educational sciences are the topic of Section 2. It consists of a personal *experience report* that seems to me to be important as a bridge between the theoretical and research situation in the literature on the one hand and the development of the model on the other. Finally, in Section 3 I present the triple peer review model as a preliminary *development result*. The goal of the model is not to produce a fundamentally better peer review process in itself but rather to attempt to conceive a peer review process that fulfills several functions and thus determines various reviewer rolls and combines them with one another.

1. Framework: Peer Review in the Scientific Publication System

1.1 Characteristics and Functions

The English term "peer review" is also commonly used, with the same meaning, in German scientific and academic language. In peer review, academic or scientific peers evaluate or appraise scientific works in regulated processes with reference to the principal of collegiality in combination with the principle of the self-regulation of economics (Neidhardt, 2010, p. 280 f.). Peers are experts in the field of each respective appraisal and are thus part of the self-regulating scientific process. It is commonly assumed that there is usually not a particularly large difference in values between the individual whose work is to be evaluated and the one who will evaluate it (Power, 2008, p. 19). Peer review in this sense is an important part of the scientific publication system, especially with regard to journals.

However, there is no single peer review process; rather, an evaluation by peers can take very different forms. For example, peer review processes vary in who is considered for the role of reviewer and how the selection is made, how many reviewers are involved in a given evaluation, what information the parties involved receive during and after the process, how the individual steps of the review proceed, and to what degree the parties involved come in contact with each other and are able to communicate directly (Müller, 2008, p. 97).

Peer review as a form of mutual observation and inspection (in effect, a form of self-censorship) goes back to the seventeenth century when the natural sciences developed: Hornbostel (2008, p. 65) point out that noble gentlemen, peers obligated by professional honor, should ensure the correctness of experiments, if necessary through demonstrations before witnesses. At the foundation lay a "vision of philosophical virtue" in the form of objectivity and an unbiased perspective, under the slogan of the ethos of science, even though this virtue can never be factually redeemed (Hornbostel, 2008, p. 67 ff.). If in the beginning the concern was ensuring that experimentation was performed "correctly," today peer review is supposed to deliver comprehensive quality assurance (Müller, 2008, p. 97). Peer review in the publication system is supposed to ensure that no articles of lesser quality are published. The scientific publication system primarily has the functions of preservation and distribution (Tauber & Weingart, 2010, p. 166 f.). The publisher-controlled system of scientific journals is one whose capacity is limited (or artificially limited). Under the condition of scarcity (of available pages in a printed volume or available resources for editing digital texts) it is necessary not only to separate "good" texts from "bad" but also to make a selection from among those "good" texts.

As a result, peer review today primarily has a *selection function* or gatekeeper function (Bornmann, 2008, p. 24). However, peer review can also take on a "construction function" in the sense that reviewers (or publishers) intervene in the scientific process in a preventive or supportive manner in order to, among other things, push through specific standards for a given subject (Neidhardt, 2010, p. 281 f.). I would, however, describe this form of "constructive" intervention as a *controlling function*. It is also possible that the construction takes the form of a kind of negotiation (Liu, 2014): a social negotiation process emerges when (possibly iterative) revision notes lead to the author and reviewer making the text better in a shared process of refinement. In this case one can say that peer review takes on a *collaboration function*. Critiques of peer review in particular note that one should employ it not only for selection and control but that one should also take advantage of the opportunity to stimulate critical discussion, an exchange of thoughts, or briefly, a discourse, in peer review processes (Osterloh & Kieser, 2015, p. 318 f.); this extends inner-scientifically from peer review as an *insight function*. Finally, there exists the possibility of an individualized *learning function* for the participants. This can develop out of an exchange between the author and the reviewer(s) (Hempel, 2014, p. 175).

1.2 Problems and Criticism

The criticism of peer review is large and extensively documented (Hornbostel, 2008, p. 66 f.; Osterloh & Kieser, 2015, p. 307 f.). The most important critical points, for which numerous empirical results have been provided, are: that peer review lacks reviewer reliability or agreement as well as validity and fairness; that the costs are too high, the delays are too large, and the predictive quality is too low; and that there is a bias in favor of mainstream research and a lack of transparency. According to an additional critique, those factors, together with the introduction of an artificial market logic (scarcity), lead to the development of "perverted relationships" between authors and reviewers (Binswanger, 2010, p. 148 ff.), which are undesirable and which have little to do with the aforementioned ethos of science.

An additional challenge is presented by the competence of a given reviewer as well as the fit between that competence and the text that is to be evaluated. For example, one can assume an inverse relationship between expertise and bias (Neidhardt, 2010, p. 284), which means that the better the competence of the reviewer fits the work that is to be evaluated, the closer the reviewer is to the object and/or the author, with the result that it is more difficult to maintain a critical distance. Furthermore, there are some other cognitive and social obstacles that have already been sufficiently described elsewhere (e.g., Fischer, 2004; Suls & Martin, 2009).

If one considers that many articles that have gone through an extensive review process will never be cited (Lewin, 2014, p. 168 f.) or that only a small portion of those publications will be cited frequently (Tauber & Weingart, 2010, p. 166), the question about the relationship between effort and result arises. Fischer (2004, p. 58) notes that the choice of public review (with all participants publicly named) or a single-, double-, or triple-blind process is not a question of principle but rather of practicality and results.

Moreover, not only are peer review processes criticized, with significant empirical evidence testifying to the problems identified above – research on peer review is itself subject to increasing criticism because research results regarding peer review are inconsistent, ambivalent, and partially contradictory (Hornbostel, 2008, p. 66 f.; Neidhardt, 2010, p. 282 f.). Among other issues, there is the question of whether peer review can really be modeled as an evaluation process or even as a scientific measuring process (Hirschauer, 2004, p. 75). This is particularly the case when empirical studies examine the reliability and validity of peer review processes (and therefore the quality criteria of quantitative research). In this way one can fundamentally question their reliability, in the sense of the agreement of reviewers as a requirement for the peer review of texts. On the one hand, a reviewer's dissent can also be functional when various scientific perspectives are integrated in the process (Neidhardt, 2010, p. 284); on the other hand, one cannot expect that consensus will be achieved if reviewers are explicitly selected with the goal of covering diverse, differing perspectives (Hirschauer, 2004, p. 76).

Lack of "respect for difference in research" (Simon & Knie, 2007, p. 28) is an accusation that is directed at the practice of peer review as well as at research on peer review. The criteria for merit or quality used by a review should establish and maintain standards and should implicitly emerge from the comparability of the scientific works that are to be evaluated. Various scientific disciplines, however, strongly differ in their research practices and products (Simon & Knie, 2007, p. 27) and for that reason are not easy to compare. The differences between the criteria for evaluating quality in the humanities and the natural sciences are particularly striking. Criteria like breadth of knowledge of the material, originality of research, aesthetics of language, analytic sharpness, reflexivity, and a focus on the addressee (Horstmann, 2014, p. 136) often play only a marginal role in natural science publication systems. Even within disciplines, current empirical results show that their sub-disciplines only partially share quality criteria (Hug, Ochsner & Daniel, 2013).

1.3 Suggestions for Improvement and Alternatives

There are numerous suggestions about how one can resolve deficiencies in the peer review of articles, whether they be empirically investigated or "only" anecdotally experienced (whether individually or collectively). The ambiguous evidence from peer review research together with the framework conditions of current research, however, seems to make its implementation difficult; it also indicates a preference for stability, especially as regards the preference for the double-blind peer review process (wherein the reviewer and author remain anonymous). In the following paragraphs I will limit myself to sketching, merely as examples, some suggestions for improvement and alternatives, in order to show their range.

- *Increase reviewer competence*: Since the importance of the reviewer's competence as it relates to the quality of decisions in peer review processes is indisputable (Fischer, 2004, p. 56), it would seem to be important to practice competences relating to reviewing and evaluating articles and to offer appropriate support (Sternberg, 2006). This suggestion addresses peer review's learning function on the part of the reviewer, which, however, is only sparsely mentioned in the literature (Hempel, 2014, p. 175 f.); in practical terms this form of problem solving can (unfortunately) hardly play a role.

- *Do not conduct an initial selection:* A much more influential suggestion would appear to be the proposal that reviewers evaluate the quality of a text not before but rather after its publication. Known as post-publication peer review (Kriegeskorte, 2012; Pöschl & Koop, 2008), such an approach would above all curb the selection function of peer review. However, this type of solution, which exists in several variations to various degrees, is almost exclusively practiced by open access journals in the natural sciences.

- *Make reviews public*: Post-publication peer review is generally linked with open peer review, in which the evaluations (anonymous or not) are made publicly available (Ford, 2013). This approach is intended above all to bring transparency to the review process and to increase the chances for discourse by enabling others (including the original author) to respond to the now-available reviews. Among other factors, however, a lack of acceptance among reviewers and authors has prevented a greater spread of this solution (Sullivan, 2014, p. 4).

- *Select more diverse reviewers*: It is generally considered to be a sign of quality in the peer review process when the author and reviewer (and occasionally the editor and reviewer) do not know each other, but this prevents the generally existing possibility of a fruitful collaboration. Under the rubric of peer-to-peer editing the suggestion is made that the selection of reviewers be varied, and that the author be involved in it, with the goal of achieving a better balance between expertise (with closeness) and lack of bias (with distance): for example, the author seeks out a "senior scientist" as an editor, who then invites expert reviewers who can complement the author with their own suggestions (Kriegeskorte, 2012, p. 12). To my knowledge, this suggestion has only been implemented once.

- *Frame peer review differently*: Since the doubts about the modeling of peer review as a measuring process are well-founded, a fundamental solution consists of framing the review process as a social process or as communication (Liebert & Weitze, 2006, p. 12; Gloning, 2011, p. 5). In this framework, dissent and disagreement become genuine components of peer review as a negotiating process (Horstmann, 2014, p. 141; Hirschauer, 2004, p. 77). The resulting scientific quality evaluations are then also genuinely social. As a result, it is no longer a flaw when reviewers have an *opinion* about the text before editing, when they form an *impression* of the text while reading it, and afterwards prepare an *statement* (in the sense of a rationalized judgment) about the text (Hirschauer, 2005, p. 80 f.). However, what that means concretely for the design of a peer review process remains unclear in the literature.

1.4 The Situation in the Educational Sciences

Essays and discussions about peer review, its forms, research, and alternatives, are found above all in medicine, the natural sciences, and sociology; critiques of evaluation criteria also appear to some extent in the humanities. The *educational sciences* are hardly directly addressed anywhere. The educational sciences are composed of several disciplines, particularly pedagogy, education, psychology, and sociology (Kuhberg-Lasson, Singleton & Sondergeld, 2014, p. 135, 141). As a result, various standards for methodology and scientific quality exist side by side – in their general practices as well as in their approaches to peer review.

In the social sciences and humanities, peer review has significantly less relevance when compared with its standing in the natural sciences; this, however, also has to do with the fact that the diversity of publication media is greater (Kuhberg-Lasson et al., 2014, p. 136 f.). Psychology, on the other hand, increasingly orients itself on the natural sciences and their standards, which includes its approach to peer review. In pedagogy the relevance of peer review is also increasing (among other reasons, because of the increase in publication-based doctorates) (Gruschka, 2012). At the same time, pedagogy is influenced to a great degree by national thought patterns and scientific traditions as well as by national education policy guidelines (Kuhberg-Lasson et al., 2014, p. 139). In any event, scientific-cultural differences between the disciplines involved distinguish the field of educational science – including its publication practices. A current study of the presence of pedagogy in leading German- and English-language publications as well as European and US-American publications (Zierer, Ertl, Phillips & Tippelt, 2014) shows that nearly all journals considered relevant work with a peer review process; however, the nature of those peer review processes is not specified in the study. Against this background, educational science journals are faced with the challenge sketched out above to a significant degree: dealing with difference in science, finding constructive strategies for dealing with disagreements and controversies, and especially appropriately differentiating the functions of peer review and the role of the reviewer with regard to his tasks.

2. Field Report: Trial and Error on the Peer Review Path

Peer review in the educational science publication system has been not just a theoretical but also a practical concern for me for several years in my research, teaching, and efforts to support young academics. This reveals itself in various attempts to experiment with alternative peer review processes and to learn from the resulting experiences. In the following sections I would like to present these attempts in four (chronological) stages; first I will outline and contextualize each stage (*project sketch*), then I will briefly codify the role of *peer review* based on the remarks in Section 1 of this paper, and finally I will sketch the resulting *experiences and conclusions*.

2.1 Peer Review in an Online Community: Bildungswissenschaftler 2.0

Project sketch. Bildungswissenschaftler 2.0 ("Educational Scientists 2.0") was an online community or social network[1] of researchers (keyword: web 2.0) initiated by Christian Spannagel[2] and myself that stimulated a pubic exchange, enabled mutual feedback that was accessible to all those who were interested, and in this way implemented a form of peer review with which collaborative knowledge production could be supported and encouraged. The goal was to make working papers, early drafts of ideas, and preprints available online so that peers could comment on them and provide constructive criticism. In the ideal case texts would be discussed publicly and improved in advance of their submission and publication. Additionally, the intent was also to discuss articles after their publication in order to further develop the ideas contained in them. At first the network was limited to the fields of education (including information, knowledge, teaching, and learning) and media. In the first months around 100 researchers registered as community members. The community forum was mainly used for concrete questions regarding text production. Complete evaluation processes with comprehensive feedback only occurred in individual cases at the start of the community building.

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[1] On the mixxt.de community platform: http://wissenschaftler20.mixxt.de.
[2] Professor of Mathematics and Mathematics Education at Heidelberg University of Education.

Peer review. Peer review in this community was explicitly intended to be implemented as a formative process in an informal framework via the use of social media. Our primary intention was to use peer review's insight and learning functions and to give scientists the possibility to join each other in a written and reflective exchange. In this sense, the version of peer review in this community corresponded to the process of collegial exchange as it is often practiced by authors before an official peer review process begins on the one hand; on the other hand, it differed from it in that the texts to be commented upon, as well as the feedback, were all publicly available and thus followed the open (online) peer review concept.

Experiences and conclusions. After half a year it was clear that the community was not taking up the core idea. In order to find out why and to use the opportunity presented by the fact that the community represented a gathering of people interested in new ideas about peer review (even if they did not necessarily act on those ideas), we conducted a brief online survey at the beginning of 2010 in which 30 young academics took part. Among other things, we asked the respondents to estimate the importance of various forms of peer review (single blind, double blind, open, post-publication) for various functions. The double-blind process was considered especially apt for selecting texts, while nearly all participants considered open peer review to be a good process for improving texts. Approximately half agreed with the statement that peer review encourages dialog in principle and can bring learning benefits (Reinmann, Sippel & Spannagel, 2010, p. 225 f.). All the same, the latter functions were hardly used in the online community. According to the respondents, since the online platform lacked a direct connection to a journal, exchanges there lacked the necessary gravitas. Viewed in total, on the one hand there was a need for a refined use of various forms of peer review. On the other hand, it was clear that changing current practices (with their connections to traditional processes) would be difficult and that informal peer review on a public platform does not offer sufficient individual benefits.

2.2 Peer Review in PhD Training: Writers' Workshops

Project sketch. The term "writers' workshop" refers to a concept that on the one hand describes a particular type of scientific writing workshop with which the traditional concept of supporting and building writing competence is supplemented with systematic peer review. On the other hand, writers' workshops are an alternative to the traditional process of organizing conferences: they can replace both an anonymous peer review process used for selection in the run-up to a conference as well as the later presentation of positively evaluated submissions at the conference itself with workshops in which a special form of peer review is practiced for the purpose of improving texts (Gabriel, 2007). In fall 2010 I employed the writers' workshop concept in three of a total of six half-day sessions of my doctoral colloquium. In each of these three onsite workshops, texts from three doctoral candidates were workshopped according to the following process: before the workshop an experienced author (the *shepherd*) intensively supported the author (the *sheep*) through intensive feedback (*shepherding*) with the goal of improving the text. That text was then distributed to the participants in advance of the workshop so that they could all prepare intensively. During the workshop itself things proceeded according to a fixed set of rules (e.g., summarizing the text from the perspective of the participants as a point of entry; separating the author from the group so that they can concentrate on the discussion; addressing first the strengths and then the weaknesses with concrete suggestions for improvement). The discussion participants were bound by a "culture of giving and sharing" that required mutual trust. Nine texts were discussed over the course of three months in this manner. In addition to myself, twelve doctoral candidates, a postdoc, and four guests took part. We were able to conduct the workshops as planned.

Peer review. Writers' workshops work with two reviewer roles. The first reviewer is selected by the author himself in the run-up to the workshop and serves as a kind of coach. Author and reviewer interact privately with one another. Peer review takes on a collaborative function here;

furthermore, one can assume that the author in particular will receive a learning benefit. During the evaluation process within the workshop, all the participants take on the role of reviewer and verbally discuss the text without directly interacting with the author (who is physically present). In a manner of speaking, the process takes place in a closed room, but in a group. It is designed to proceed in a collaborative manner and may have a learning function, among others.

Experiences and conclusions. Despite initial skepticism, almost all of the participants indicated that they were satisfied with the writers' workshops at the end of the project. We subjected the three workshops to a self-evaluation and utilized observation and documentation, two separate email surveys of the authors, a written survey of all workshop participants with closed questions, and an asynchronous group discussion at the end of the workshop (Reinmann, Hartung, Florian, Ranner & Kamper, 2011). The results show that both forms of peer review have their advantages and in large part contribute to creating a personal learning benefit. Participants also stated that serving as reviewers in the workshop supported the development of their own evaluation skills. Organizational problems were absent and the typical writer's workshop rules could be implemented without problems, but—as expected—the approach required a good trusting relationship among all the participants. Furthermore, it was apparent that there was a need to more precisely specify what aspects of the texts (e.g., language, content, structure, etc.) should be discussed (and improved). The type of text also played an important role: nearly all respondents said that rather than discussing excerpts of theses, the workshops should work with (short) self-contained texts.

2.3 Peer Review in a Research Collaboration: *Erwägen Wissen Ethik*

Project sketch. In 2011 the editors of the journal *Erwägen Wissen Ethik* (*EWE*) asked me to compose an article that, as is typical for *EWE*, would be commented on critically and discussed by other authors. The journal's goal, as stated on its website[3], is to "encourage contemplative contact with diversity." It considers itself to be a forum in which various schools, streams, and directions exchange views, discuss, and dispute their various perspectives, and thus discover, test, and refine rules for interacting with that diversity. In this sense, the journal also serves as a research instrument. In connection with my essay on the topic of interdisciplinary mediation (Reinmann, 2013a), I tested a new form of research collaboration that was divided into the following five phases: (1) the *kick-off* was the main article, which was significantly longer than a typical journal article. (2) The critiques provided by the other authors served as the *continuation* in the broadest sense of the word; they were intended to be discursive and to continue the argumentative process begun in the main article. (3) In the *interim conclusion* I, as the author of the main article, had the opportunity to respond to the critiques from the *continuation*. (4) This was followed by the *synopsis*, in which one of the editors performed a kind of scientific mediation of the previous discourse by compiling comparative observations, suggestions for systematization, and open questions. (5) In the concluding *summation* all the participants in the research process were invited to comment on the entire process again, based on the completed contributions from phases 1 through 4. The research collaboration was completed in early 2013 in the form described above. A total of 25 authors (including the editor and myself) participated.

Peer review. The article for *EWE* was subjected to editorial review before publication, but was not subjected to a peer review process. Instead, scientists from the most diverse disciplines possible were invited to comment on the article by writing their own (shorter) texts, which were to be published together with the main article in printed form. A written discussion among the authors was stimulated in five phases in which all the participants contributed at least twice, with the main author contributing three times. In the foreground of this form of peer review, the insight function is clearly and solely the result of a written discussion.

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[3] URL: http://groups.uni-paderborn.de/ewe/index.php?id=55.

Experiences and conclusions. My personal impression of the research collaboration was very positive (Reinmann, 2013b). The fact that 23 authors engaged with the main article and developed their own thoughts and positions in their own texts in the second phase (the continuation) represented a unique experience beyond a typical review. The heterogeneity of the commentators resulted in a broad discussion framework that uncovered questions that one would never think of while working alone. The authors of the continuations, on the other hand, knew that their texts would not be simply set aside or used only for deciding whether to accept the article or not, but rather that the content would be further developed, treated with the appropriate respect, and published. Insofar as I as the main author had the opportunity to draft an interim conclusion after the continuation, I was able to address, in a limited manner, what I had taken away from the continuations. In the concluding summation, all the participants were given space to provide their own feedback on the project overall; 19 of 23 authors took advantage of it. However, in an email exchange at the conclusion of the project, in which I thanked the authors for their great engagement, nearly half the participants responded that the effort and long duration of the research collaboration was incompatible with daily scientific work. From my perspective, the printed format also prevented the project from reaching a wider readership.

2.4 Peer Review in an Open Access Journal: *iTeL*

Project sketch. In April 2013, Peter Baumgartner[4], Andrea Back[5], and myself, along with a group of other colleagues, initiated the journal project *interdisziplinäre Zeitschrift für Technologie und Lernen* (*iTeL*[6], the "Interdisciplinary Journal for Technology and Learning") as a follow-up to the *Zeitschrift für E-Learning* ("Journal for E-learning"). The journal examined didactic, social, media, and technical innovations regarding learning from an interdisciplinary perspective and was addressed to scientists, the young academics, and interested representatives of educational practice in schools, colleges, and continuing/adult education organizations. The focus on technology and learning encouraged us to attempt to fully utilize the current possibilities for open access to scientific publications; we therefore decided in favor of an open access format. In combination with the decision to enable open access, we also decided to pursue a form of open peer review in order to break new ground with our evaluation process. On the one hand, the goal was to use the publicly available reviews to ensure high quality articles; on the other hand we wanted the authors and reviewers to be able to use the potential of the intense feedback processes as best as possible. *iTeL* was implemented using the open source OJS (Open Journal System) platform, which, however, had to be modified to support open peer review. Two issues of *iTeL*, including the reviews, were published online.

Peer review. The open peer review process at *iTeL* was based on an existing multilevel post-publication model[7] that was built around three phases: in Phase I the author submitted their article, which was then preliminarily reviewed to assess the appropriateness of the content and the formal correctness and scientific value of the research. In Phase II the article, which was available online as a discussion paper, was commented on and evaluated by invited reviewers (in the form of freely formulated texts following prescribed criteria); interested readers could also take part in the discussion, which was intended to be as respectful as possible. The author then had a limited amount of time to respond to the reviews online. In Phase III the editors decided, based on the reviews, whether or not to actually publish the article in the journal (possibly after revisions, which were typically implemented in a dialogue with the reviewer). This peer review model sustained the selection and controlling functions; however, they were only implemented after initial pre-publication of the article as a discussion paper, and they were

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[6] URL: http://itel-journal.org/index.php/itel.
[7] *Atmospheric Chemistry and Physics*: URL: http://www.atmospheric-chemistry-and-physics.net/home.html.

public. As a result of the technical possibilities, the peer review also took on an insight function through online discussions that were open to an unlimited number of participants.

Experiences and conclusions. After two issues we canceled the *iTeL* project; a number of factors – financial, organizational, and technical—contributed to the decision. One of the reasons that is relevant here is that we were unable to find many authors interested in participating in open peer review as part of a post-publication model. Furthermore, we were unable to dispel various concerns the reviewers had regarding the public nature of their reviews. Additionally, it became apparent that the reviewers devoted too much attention to stylistic flaws, issues which were not appropriate for public discussion and which did not encourage the kind of respectful, content-based discussion that was the original goal. It may also have been the case that the heterogeneous standards of the various disciplines—and thus the heterogeneous evaluation criteria—made the initial review difficult, which in turn reduced the likelihood of content-based engagement with the text on the part of the reviewers during the open peer review phase.

3. Preliminary Development Result: Triple Peer Review Model

3.1 Summary and Discussion of My Own Experiences

The examples described above, in which I was able to gather my own experiences with various implementations of peer review aimed at various goals, can be classified in various ways, as the following table shows in a summary manner.

Table 1: Comparison of Various Peer Review Experiences

Peer Review	In an online community	In doctoral candidate training	In a research collaboration	In an open-access journal
Classification	Before possible publication		Within publication system	
Medium	Online	In person	Printed	Online
Public	Public peer review	Private peer review	As a result of public peer review	Mostly public review
Group	Potentially unlimited group	Limited, defined group	Limited, defined group	Partly defined, partly unlimited group
Function/Goal	Collaboration and learning function	Learning and collaboration function	Insight function	Selection, controlling and insight function
Experience	At most, the learning function was achieved	Both functions fully achieved	Function fully achieved	At most, the selection function was achieved

The peer review processes implemented for the writers' workshops for doctoral candidate training and for the *EWE* research collaboration achieved their intended goals very well. In both cases, the goal was not selection or implementing specific standards but rather, in the former, encouraging collaboration and learning among the participants, and in the latter, achieving insight. Such a positive result was lacking in both the Bildungswissenschaftler 2.0 online community and in the *iTeL* peer review process: the online community apparently lacked individual benefits and the necessary appearance of gravity that would have encouraged participants to invest time in the intensive feedback process. The open-access journal project did project such gravity, but it was apparently not enough to compensate for other disadvantages. To the contrary: it was precisely its serious nature, combined with the selection function of the peer review process, that undermined acceptance of publicly visible reviews and responses. While the goals of the online community's peer review process were collaboration and learning, the open access journal's processes were oriented towards the selection, control and insight functions. Thus, it is clear that the success or failure of a peer review process is not determined by its function alone.

3.2 Conclusions for Future Attempts

Based on my experiences with various forms of peer review, I have come to the conclusion that peer review *can* take on all the functions discussed in the literature: selection; controlling or implementing standards; collaboration to achieve a better shared result; learning that supports individual competence building; as well as insight, particularly as it arises through discourse. In peer review practice, at least in the context of the scientific publication system, the preferred functions are selection and controlling. However, it is my estimation that there is no valid reason not to support collaboration, learning, and insight as functions of peer review in the scientific publication system as well.

One complicating factor, however, seems to be the simultaneity of several functions of peer review: for instance, when one must evaluate a text with regards to its publication worthiness while simultaneously improving it through feedback, it is difficult to meet both demands with comparable levels of quality. With that comes the problem that it is simply difficult for the reviewer to take on several roles (even when they are not simultaneous): the roles of supporter, reviewer, and decider. An additional problem could be the lack of fit between the design of the peer review process and its intended goal. If, for example, one wants to address stylistic faults of the text through feedback or even through collaboration with the author, that goal is not a good candidate for a public process. It is not comfortable for the author to be observed publicly while correcting mistakes nor is that aspect of the review process especially interesting for outsiders and potential readers (in contrast to a critical discussion regarding the actual content of an article).

Moreover, in our open peer review journal project, it became clear to me that there is an inverse relationship between the differentiation of an evaluation process and its manageability: the more precisely one defines an evaluation process in order to cover all possibilities (e.g., inappropriate feedback from interested readers, too much or too little discussion, idiosyncratic evaluation criteria, etc.), the more complex the process, the more difficult the technical support, the greater the possible confusion of the parties involved, and the greater the amount of time they need to invest. The last of these (time) is fundamentally a factor that should not be underestimated; a portion of the participants in the EWE research collaboration explicitly cited it as a problem.

3.3 The Triple Peer Review Model

The following peer review model for an educational sciences journal attempts to integrate the insights from the peer review literature (Section 1), my experiences from four different peer review projects (Section 2), and the conclusions sketched out above. I call the model *triple peer review* because it encompasses three phases and involves three (different) reviewers in different roles. The goal of the review process modeled here is to combine the peer review functions of *collaboration* (and learning), *selection* (and control), and *insight* while implementing those functions in separate phases with distinct reviewers. Rather than striving for the sweeping but not precisely specified quality control produced by peer review in scientific publishing systems, the goal is instead to strive firstly for quality development (through collaboration), secondly for quality assurance (through the use of selection criteria), and thirdly for quality differentiation (through insight-oriented discourse). The three phases are conceived as follows:

- Phase I proceeds according to a *senior editor model*: the author seeks out a reviewer with greater expertise who then serves as a *mentor*. That mentor is supportive of the text in question, decides that it should be published, and supports the improvement of the text by providing feedback. Reviewer I (the mentor) will also be cited in the byline of the article as "senior editor" when/if it is published in a journal.

This phase is based on the concept of peer-to-peer editing (Kriegeskorte, 2012) as well as the idea of "shepherding" from writers' workshops (cf. Section 2.2). The author should be enabled to engage in a trusting (and therefore private) collaboration with a peer in which the author and reviewer improve the article's quality in a collaborative process (quality development). The motivation for the reviewer to serve as a mentor is the fact that, if the process is a success and the article is published, they will be cited as the article's senior editor.

- Phase II proceeds according to the classic *peer review model*: the editor selects a reviewer with relevant expertise who serves as a *reviewer*, evaluates the submitted text according to the specified criteria (without knowing the identity of the author or senior editor), and then decides if it should be rejected or accepted (possibly with revisions). Reviewer II (the reviewer) decides for himself whether to remain anonymous or be named publicly.

  This phase accounts for the fact that, despite unclear evidence regarding peer review, peer review with a selective function plays an important, difficult to replace role in science in general and in many parts of the educational sciences in particular, and has developed into common practice as an act of quality assurance. Among other factors, the design of this phase integrates my own experiences with open peer review, which show that selection decisions made in public face considerable obstacles to acceptance (cf. Section 2.4).

- Phase III proceeds according to a *peer discussion model*: the accepted article is sent to at least one additional reviewer who serves as a *discussant* and who addresses and discusses the text in the form of an independent commentary. The author and/or the senior editor can suggest discussants. Reviewer III (discussant) is publicly named and delivers an independent text.

  This phase supports the insight function, which current peer review processes neglect; this function arises from intensive debate among peers about texts or scientific works. The quality of the text will be refined here as the reviewers contribute opinions from various perspectives. Among other factors, my positive experiences with the discussion culture cultivated by *Erwägen Wissen Ethik* (cf. Section 2.3) have been influential here.

The following figure illustrates the triple peer review process with its three phases and three reviewer roles.
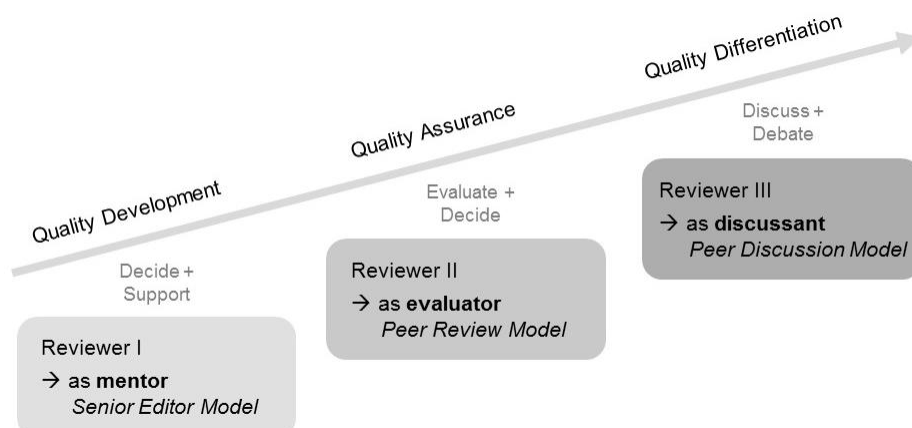

Fig. 1: Phases and Roles in the Triple Peer Review Model

The triple peer review process is more time-consuming than other models, like the classic double-blind peer review, but thanks to its clear separation of roles and tasks it is easier to understand and more clear-cut than current post-publication peer review processes. In the form described above, triple peer review is intended to increase the quality of articles while facilitating content-based exchanges about them. It is difficult to make it compatible with the now-current motto "publish or perish" in the sense of the ceaseless production of studies and their treatment in brief articles, in which, because of the ever-increasing quantity, less and less time can be invested (Gruschka, 2012, p. 5). In this context, a motto like "polish and publish" must take root instead – a commitment to first refine a text in cooperation with various reviewers and then to publish it, and to continue to develop it through rich discourse in its published form.

3.4 Attempt at Implementation

The triple peer review model should be experimentally implemented and tested in a new journal project. It concerns a journal that addresses development-oriented educational research or design-based research[8] in the educational sciences. The thematic focus on design-based research requires an interdisciplinary spectrum: articles can therefore come from pedagogical, psychological, sociological, economic, or information technology origins, as long as they address educational topics. Four thematic rubrics (school, college, adult/continuing education, and career training) and two forms of article (scientific articles and practical illustrations) are planned. For example, the journal will include theoretical or methodological essays on design-based research, concepts for design-based research projects, results from various phases of design-based research projects, presentations of complete design-based research works (scientific articles), as well as text, image, audio, and/or video supplements to scientific articles, extracts from design-based research for specific practical goals, innovations from educational practice as motivators for design-based research, and similar works (practical illustrations). The multidisciplinary contributors as well as the diversity of articles will require an especially refined way of dealing with evaluation materials, which the triple peer review model can provide.

The journal should offer established scientists as well as young academics the opportunity to make development-oriented research topics public and grant access to critical discussions. The stated goal is to support the paradigm of design-based research, to contribute to the (continuing) development of scientific standards, and to establish a publication platform from which research and practice can benefit in equal measures. The journal will be an electronic journal project; the goal is an open access journal. The articles will appear in English and possibly other languages, including German[9]. The triple peer review model (cf. Section 3.3) will be an intrinsic element of the journal. The first three complete cycles of the review process should be observed and documented in detail for later evaluation.

The evaluation will concentrate on the special peculiarities of the triple peer review model. Three aspects will be analyzed: 1) whether and to what extent the three planned phases can be implemented in the way they have been theoretically conceived, 2) whether and to what extent the three core functions of the peer review process can be fulfilled from the perspective of the author, the reviewer, and the reader (insofar as they can be evaluated), and 3) what effects the separation of reviewer roles and of tasks for authors and reviewers have on the processes and results of the publication process.

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[8] See e.g., McKenney & Reeves (2012), Euler (2014), Sloane (2014), Reinmann (2015)
[9] A multilingual approach is deemed sensible because part of the foundation of design-based research, is to strive for practical benefits in addition to the scientific insights, so that providing access for interested readers (in their own languages) is important.

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