Editorial

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When a paradigm becomes a paradogma

Every science, every scientific discipline, operates under one or more paradigms; a *world view* that underlies the theories and methodologies of the discipline. Sometimes a discipline's paradigms complement or supplement each other while at other times they may contradict or even exclude each other. While paradigms are strong and have longevity, they are also fluid, relative and changeable and can even 'die'. An anathema of the sciences, scientific disciplines and the process of carrying out science (or as Derek Hodson[1] calls it: 'doing science') is the *dogma*. In contrast to a paradigm, a dogma is a *set of principles* or a *doctrine* prescribed by an authority as incontrovertibly true. Dogmata are possibly most often found in religion, forming the core principles that must be upheld by all believers of a religion. As such, dogmata are also strong and have longevity, but are static, immutable and almost unchangeable except by divine decree. This editorial discusses a recent case which I and some colleagues encountered where a highly reputable scientific journal's editorial decision was not based on the article's quality (e.g., weak theory, bad methodology, improper statistics, . . .) or misuse of a scientific paradigm (e.g., a methodology that does not fit the paradigm used), but rather on a dogma (i.e., the author questioned something that one of the executive editors found to be incontrovertibly true). In other words, a rejection based on a paradigm that has reached the status of a dogma; a *paradogma*.

As chief editor of one journal (this one) and associate editor of another, I get to see many different manuscripts running the gamut from small-scale laboratory experiments to large-scale ecologically valid experiments in schools; from rigorously controlled intervention studies for confirming/rejecting hypotheses to broad questionnaire cohort studies which are looking for relationships. The usual procedure for an incoming manuscript is that I and my associate editor first check to see whether the manuscript fits the *Aims and Scope* of the journal. If that is not the case I do not send it out for review, but rather reject it as quickly as possible as being 'Out of Scope' so as not to burden the author with waiting for a review that will not come. For example, an article for this journal should be about computer assisted learning. If the computer does not play a prominent or integral role in the research and if the research does not measure learning in one form or another, then it falls outside the scope of *JCAL* and will be quickly rejected as being out of scope. This rejection has nothing to do with the quality of the manuscript! If we determine that a submitted manuscript falls within the scope of the journal, one or both of us then carry out a quick 'diagonal reading' of the manuscript to see if everything is technically in order. This technical check ranges from looking to see if the submitted manuscript is really an article or whether it is more a paper that would normally be found in the proceedings of a conference, to determining if the methodology used is sound for both the research that was carried out and the claims that the author or authors are making, to the quality of the language and the format of the text. Finally, if the manuscript passes all of these 'tests', we then try to choose the best reviewers for the manuscript based upon what the article is about and the expertise of the reviewers and then let them do their job. If they deem it worthy of publication (usually after one or two rounds of revision) it will be published online and physically as quickly as possible, and if it does not, then I reject it and tell the author/authors exactly why.

The journals that I edit, I am a board member of and I review for (about a dozen at the moment) publish a strikingly eclectic array of research. The research can be based on behaviourist, cognitivist and/or (social) constructivist learning paradigms; can make use of quantitative, qualitative and/or mixed-methods approaches to the research; may have been carried out in a laboratory, a school, a museum and/or commercial workplaces; their design can be experimental, quasi-experimental or design based; and so forth. What is never an issue is the scientific paradigm that the author has chosen to use.

Article 1 of the Committee on Publication Ethics' *Code of conduct and best practice guidelines for journal editors*[2] states that 'Editors should be accountable for everything published in their journals. This means the editors should . . . champion freedom of expression . . . Editors' decisions to accept or reject a paper for publication should be based on the paper's importance, originality and clarity, and the study's validity and its relevance to the remit of the journal.'

This being said, the reason that I am writing this editorial is because I recently experienced something that I have never experienced before (as academic, author, reviewer or editor) and hope never to experience again.

What is the case? A PhD student contacted me and some colleagues via email about the fact that (s)he felt that an article that (s)he had written and submitted to a well-known and highly reputable journal (one which I myself have published in!) was being rejected, not on the grounds of its quality, but rather because of the journal/editor/reviewer's ideology. But before proceeding, I need to emphasize very strongly that neither I nor my colleagues were co-authors or personally associated with the PhD or the production of the article at any time or in any manner. I am thus not complaining about the rejection of one of my papers or a paper written by a colleague or student of mine! I am also not discussing whether the article in question had the requisite scientific quality to be published; that is for others to decide. This PhD student took the liberty of emailing the editor of the journal as to what the reason for the rejection was. The long and the short of it was (1) there was a 7-month delay between submission and rejection because the article was inconsistent with the current direction of the journal; (2) that it was not consistent with current theory, research, and practice in science education and specifically questioning hands-on science instruction and arguing for didactic teaching of science; and (3) there was no problem with the methodology but that the focus on direct instruction is not consistent with the practices of the Next Generation Science Standards (NGSS).

A few comments are in order here:

First, the seven months is rather long for what appears to have been an 'Out of topic' rejection.

Second, I checked the aims and scope of the journal and could find nothing about a current direction that excluded research arguing for didactic teaching or against inquiry learning.

Third, if a paper can be rejected because it is not consistent with current theory, research and practice in a field, why does one need the journal at all? Implicit in this statement is that the editors already know all the truth that there is to be known.

Fourth, and finally, this is all even stranger if you actually read what the *Next Generation Science Standards* itself states. Here are a few simple quotes from the official documents on the NGSS website:

> It is important to note that the Scientific and Engineering Practices are not teaching strategies – they are indicators of achievement as well as important learning goals in their own right.
> The NGSS are standards, or goals, that reflect what a student should know and be able to do – they do not dictate the manner or methods by which the standards are taught. The performance expectations are written in a way that expresses the concept and skills to be performed but still leaves curricular and instructional decisions to states, districts, school and teachers.
> Practices represent what students are expected to do, and are not teaching methods or curriculum.
> This focus on achievement rather than the curriculum allows educators, curriculum developers and other education stakeholders the flexibility to determine the best way to help their students meet the standards based on their local needs.

While the rejection of a manuscript in this way is a problem, the real problem goes deeper. What we are experiencing here is the transition from a scientific paradigm to a scientific *paradogma* (my neologism[3]: please cite me on this). The *Oxford English Dictionary* defines the term paradigm as 'a typical example or pattern of something; a pattern or model' and further as 'a world view underlying the theories and methodology of a particular scientific subject (e.g., the discovery of universal gravitation became the paradigm of successful science)'.

Analogous to this, I define *paradogma* as 'a typical example or pattern of something; a pattern or model that is so incontrovertibly true for a person or group of people that it excludes the existence and value of all other patterns or models' and further as 'a world view underlying the theories and methodology of a particular scientific subject that the users see as the only world view that is of any value (e.g., the conspiracy theory

that Barack Obama's is not the legitimate president of the United States because he is not a natural-born US citizen is the paradogma of birthers in the United States)'.

And now the problem: The article in question was a scientific article and was submitted as such (remember that this is not about its scientific quality or lack thereof). Science, by definition, is a system of knowledge covering general truths or the operation of general laws as obtained and tested through scientific method. It builds and organizes knowledge in the form of dynamic, testable explanations and predictions about the world based on sound scientific methodology (quantitative, qualitative, mixed, . . .).

A dogma, in contrast, is a principle or set of principles laid down by an authority as incontrovertibly true. It is a prescribed doctrine, decree or ordinance authoritatively set out as unquestionably true by a particular person or group; it is something that is inherently true in the world and is based on belief.[4] Synonyms are: tenet, canon, law, conviction, certainty.

Remember, the manuscript in question was not rejected because of its methodology but because its focus on direct instruction, according to the Editor, was not consistent with specific practices. The manuscript, thus, was rejected not because it was methodologically flawed but rather because the author was not a believer in the incontrovertible truth of – in this case – inquiry science as the unquestionable gospel truth! Welcome back to the dark ages.

While science is dynamic and changeable (see the shift from the Church dogma of the earth as centre of the solar system to the Copernican heliocentric view or the addition of the quantum view of physics to the then existing Newtonian one), a dogma[5] is a static and immutable belief that often forms the primary basis of a belief system or ideology, and which cannot be changed or discarded without affecting the system's existence or the ideology itself. If something contradicts this belief, it is either rejected out of hand, stubbornly ignored, or extenuating circumstances are found/devised that can explain why the expected or hoped for result was not found.

It appears, thus, that the journal and its Editors are not only proponents of a paradigm (one could convincingly argue that all journals/editors/reviewers feel at home within one or more scientific paradigms and carry out their research/look at and evaluate the research of others based upon that paradigm), but apparently base review and publication policy on a specific *paradogma*. In this case: If your article dares to advocate against inquiry learning and/or argues for a return to the didactic teaching of science, then you had better chosen a different journal for publication. As a result of this, the PhD student in question has not only had an article rejected, but has also learned a lesson, though in my opinion the wrong lesson, namely: There are politically correct scientific paradigms and you had better be/become/look like a 'believer' in that paradigm or you will not be published in that journal. That's the wrong lesson to learn if you are a novice, aspiring scientist.

As my esteemed colleague astutely remarked: Rejecting papers that are not consistent with current theory, research and practice . . . 'is astonishing. I've never seen an academic journal state this so blatantly. If they already know all the truth that there is to be known, I am surprised they need to publish anything.'

Maybe Mason Cooley, an early 20th century American aphorist, was correct when he noted[6]: 'Under attack, sentiments harden into dogma.'

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Notes

[1]Hodson, D. (1985). Philosophy of science, science and science education. *Studies in Science Education, 12*, 25–57.

[2]http://publicationethics.org/files/Code_of_conduct_for_journal_editors_1.pdf

[3]There is a studio album with this name released by a 'brutal' Italian heavy metal band named Hour of Penance.

[4]According to Thomas Aquinas, on the defined doctrines and dogma of the Roman Catholic Church, if you knowingly contradict the Papacy and doctrines as the Pope defines them, then you are a classed as a heretic.

[5]http://en.wikipedia.org/wiki/dogma

[6]http://quotes.dictionary.com/under_attack_sentiments_harden_into_dogma