

## Scientific musings — the interpretive stage

The scientific research process is not just a method in which we garner copious amounts of information for various uses; instead its saliency is grounded on “disciplined inquiry” (Shulman, 1988, 184), quantitative/qualitative data, and unceasing verification; processes privy to both applied and basic research methods. Research can also be a tool that empowers us; it can interpret the scope of our findings more broadly, substantiate or refute our claims, and encourage diverse perspectives, even when our topic seems highly granular. Educational research is also a process, it arrives at an initial state of discovery and proceeds to work through various levels of interpretation and evaluation; yet, many distance educators (our primary focus) find that with the constant changing landscape, there is an overwhelming “abundance of technical and statistical information” (Boudah, D. & Weiss, M., n.d. ¶1) that is anything but useful or relevant.

How then do we as educators utilize research without losing our focus or becoming too dense? In this essay I will argue that in order to substantiate any kind of return on research investment, we must remain wedded to the applied research approach, (regardless of which stream we adopt — summative, formulative, or action based) including placing an emphasis on the *interpretation of data*, a step in the research process, which takes into account the “credibility of the interpretation, limitations of the study” (Boudah, D. & Weiss, M., n.d. ¶ 20), and comparisons which include “wide ...educational implications” (Neuman, 2006, 14). By interpreting the data rather carefully, educators can then apply

(and provide) real solutions to real problems; which is “good practice for any research or evaluation study”. (Whyte, 2000, section 6, Data analysis and reporting)

### **Summative, Formulative, and Action Research**

The applied research process provides more than solutions to problems; it also includes streams of an evaluative nature, namely summative, formative and action research. Summative research “seek[s] more limited generalizations” (Patton, 1990, 156) while formative tends to remain very focused and specific, such as “monitoring and continuous feedback”. (Neuman, 2006, 27) Action research is not only tricky, but as a form of self-evaluation, it can be very “difficult to master” (Ponte, 2002, 399) especially if educators “ignore their own practice” (Ponte, 2002, 410) and refuse to evaluate themselves. Many educators see action based research contingent upon the “action of others” (Ponte, 2002, 410) with change happening “only when teachers experience ... [their own] discrepancy.” (Ponte, 2002, 402) Typically, applied researchers use both formative and summative evaluation techniques when conducting research studies (Neuman, 2006, 28), but with the impetus of e-learning activities becoming more apparent, action research is proving highly beneficial; albeit many of the findings are usually not published, or left to be “disseminate[ed] ... through briefings, staff discussions, and oral communications.” (Patton, 1990, 157)

In addition, there are seven dedicated steps that are used when conducting education research studies; not unlike the scientific method they are

in order of process, select topic, focus the question, design the study, collect the data, analyze the data, interpret the data, and lastly inform others. The step which I will be considering is the second to last step, interpretation of the data.

### **Credibility**

Credibility of a research study is a difficult task for any evaluator to provide. On the one hand, school educators (cynically) believe that many research studies are “biased, rigged ... [or] predictable.” (Patton, 1990, 23) On the other, they tend to believe that researchers skew results in order to benefit the funding institutions that supply their stakeholders. With educators’ opinions less than confident in the evaluation process, credibility and validity are extremely important, especially when the *integrity* of the report can significantly determine future positive (or negative) events.

Before any evaluation is begun, evaluators must adopt a perspective that is dedicated to “neutrality, [balance, and most of all] “no predetermined results to support”. (Patton, 1990, 55) Quantitative data may be objective, but humans are not; making it extremely difficult to remain impartial. Since the researcher is such an important part of the process (and human) any biases that the researcher has should be provided, including a brief history and personal “information.” (Patton, 1990, 472) Subsequently, if a researcher has a particular discrepancy that was hidden but later revealed, the report can appear less credible or worse, moot. When a research study includes biases and background, the perception of integrity is maintained, including the suggestion that those reading the report are

capable of judging for themselves the legitimacy of the process. (Patton, 1990, 462)

Triangulation is another process that “reduce[s] the potential [for] bias” (Patton, 1990, 468), and validates credibility. In short,

“Triangulation is a process by which the researcher can guard against the accusation that a study’s findings are simply an artefact of a single method, a single source, or a single investigator’s biases.” (Patton, 1990, 470)

What triangulation attempts to provide “is a cross-check through different modes of inquiry” (Weiss, 1998, 263); any evidence that can provide various perspectives will most certainly “increase [the] confidence in the original [study]”. (Patton, 1990, 462) In addition, if researchers can show negative (or the failure of) evidence contrary to the study and provide this information openly (Patton, 1990, 462) not only will the credibility of the report be easier to attain, but that of the researcher also. Credibility of researcher equals credibility of report and vice versa.

### **Limitations**

All limitations that involve the study’s design must be reported (Neuman, 2006, 25), especially if there are concerns that other researchers may wish to pursue additional related study’s at a later date. (Neuman, 2006, 25) Limitations should include (but not inclusive) variances in empirical data, lack of funding resources, deviant participatory behaviour, and environmental concerns. Initially, the report should address the scope of the study, specifically the perspective to

which it is addressing. If the report does not specifically differentiate who the results are for, neither stakeholder nor organization may understand why or how the results were determined. In addition, while some limitations may generalize or oversimplify stated themes, they are still important; placing them in the report can greatly reduce the chance of misconstruing the study or inhibit unexpected results later. (Weiss, 1998, 185)

Another limitation that provides saliency is “thick description” (Geertz, 1973) which describes “the voices, feelings, actions, and meanings of interacting individuals.” (Denzin, 1989, as cited in Patton, 1990, 430) When working with “humanistic concerns and humanistic ideologies” (Patton, 1990, 124), conflicts can arise, (either with the researcher or each other), and if not detailed in the report, candidly mentioned. By stating upfront that there was “former relationships affect[ing] the ...operations of the program” (Patton, 1990, 246) including observable human conflict, the report stands to gain a more broad perspective, including bringing all of the issues together in context.

### **Wide educational implications (including comparisons)**

Interpreting the data encompasses more than just the initial findings; it should also include the implications of the study for future references. It is important for researchers to (at this point) address any and all significant impact(s) that the study has found, be they positive or negative. In addition, researchers can contrast and compare alternative reports, such as similar studies in which the findings were relevant, but in this case completely irrelevant. Suggestions can also include wider educational implications, “speculative

analyses” (Patton, 1990, 423) and exploratory evaluation measures that can forecast the importance of the study, including the perception that “as ... research proliferates, [the] importance of ...diverse studies will increase.” (Patton, 1990, 427)

The researcher can also provide “alternative interpretations” (Neuman, 2006, 14), not as a negative implications, but instead as a way to address a particular outcome that may have become apparent as the study progressed or future implications that may appear if other factors are added or removed. Researchers should “go...beyond the descriptive data” (Patton, 1990, 423), and provide reasonable solutions to all implications as a way to address all areas possible.

### **Summary and conclusion**

While a myriad of processes must be considered when setting out to critique a research study, it is imperative that we interpret the data to its fullest extent, regardless if they are only “quick, small-scale stud[y’s]” (Neuman, 2006, 25) and infrequently published. The applied research process does “make more tradeoffs... [but it still] require[s] an in-depth knowledge of research” (Neuman, 2006, 26) and dedication; basic research is only part of the process, and much more viable if used in conjunction with applied research methods. This essay provided only a slice of the whole research process, but through the interpretation of data, we can solicit a more robust critique, one that looks at how credibility is achieved, all limitations of the study, and future educational wide implications (including comparisons).

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