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The DIKW Hierarchy and Adventist Theological Education

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THE DIKW HIERARCHY AND ADVENTIST THEOLOGICAL EDUCATION

A Paper

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by

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INTRODUCTION

The purpose of this paper is to explore some aspects of information theory as they apply to theological education, more specifically, the academic portion of the training of the future leadership of the Seventh-day Adventist Church. The paper will be divided into two sections, as illustrated by an anecdote shared by Robert Darnton. "One of my colleagues is a quiet, diminutive lady, who might call up the notion of Marion the Librarian. When she meets people at parties and identifies herself, they sometimes say condescendingly, 'A librarian, how nice. Tell me, what is it like to be a librarian?' She replies, 'Essentially, it is all about money and power.'"[1] It is my contention that "information" and the role it plays in theological education is indeed about 'money and power.'

In contrast with the Foucaultian vision of power and knowledge, which focuses on the advantages that having knowledge provides in society, Paul writes, "I am not ashamed of the gospel, because it is the power of God that brings salvation to everyone who believes." (Rom 1:16).[2] He also asserts, "faith comes from hearing the message, and the message is heard through the word of Christ." (Rom 10:17). To contextualize this chain of reasoning, God achieves His purpose by sharing pertinent information, namely, the word of Christ. So "knowledge is power," and it is that divine power that theological education engages.

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[1] Robert Darnton, "Google & the Future of Books," *New York Review of Books* 53, no. 2 (2009). http://www.nybooks.com/articles/22281 (accessed 4/29/2009).

[2] Unless otherwise indicated, all Scripture references are from the *Today's New International Version*, (Colorado Springs, CO: International Bible Society, 2005).

In the fields of information science and the related area of knowledge management, we have conceptualized a hierarchy that consists of data, information, knowledge and finally wisdom, the DIKW hierarchy. In typical scenarios, the progression seems intuitive and straight forward.

The medical doctor collects all the facts about a given disease through a variety of measurements. Businesses collect sales figures, demographics, expenses, all reported in some form of numbers. Scientists count, measure, record, *ad infinitum*. Educators give tests, and measure the results. This is the data.

At some point the data is organized and formulated into a symbolic synthesis. Doctors look for patterns in the data. Businesses organize the data into reports and statements. Scientists formulate theories. Educators give grades. This transforms the data into information, and the process is completed when these outcomes are recorded into an artifact that can be stored, shared and understood by others.

Then the information is evaluated and analyzed. If the information is accepted as a true representation of reality, in other words, 'believed', it becomes knowledge. When this knowledge is used to make good decisions, wisdom has been invoked. Doctors make accurate diagnoses and prescribe effective treatments. Businesses respond effectively to their customers, and make wise decisions concerning their investments. Scientists solve a problem. Teachers effectively engender learning.

That is the construct. In reality, the boundaries between the components of the DIKW hierarchy are particularly fuzzy, and this fuzziness has lead to considerable debate.[3] The simple act of recording the observed data could be considered creating information, even prior to any meaningful analysis. And how does one measure knowledge formation?

In theological education, the boundaries are particularly ambiguous. What would we consider to be the "data"? In one sense, the primary data of theological inquiry is the Scriptures. As Peter wrote: "For we did not follow cleverly devised stories when we told you about the coming of our Lord Jesus Christ in power, but we were eyewitnesses of his majesty. … We also have the prophetic message as something completely reliable. … For prophecy never had its origin in the human will, but prophets, though human, spoke from God as they were carried along by the Holy Spirit." (2 Pet 1:16, 19, 21). The "data" consists of the testimony of reliable witnesses and the record of divine inspiration. But because it has been recorded and organized into a communication artifact, it is also "information." Yet this "information" that we hold in our hands represents the "knowledge" of the authors, and that the Scriptures have been preserved through time is an evidence of its "wisdom".

The point of this excursion into information theory is to more precisely delineate the function of the library. It is to provide access to "information." Thus for purposes of discussion, it is necessary to delimit the term "information" in the context of theological education. To do this, two Scripture references will be used.

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[3] Martin Frické, "The Knowledge Pyramid: A Critique of the DIKW Hierarchy," *Journal of Information Science* 35, no. 2 (2008). Frické argues for the abandonment of the hierarchy because a close examination of the concepts of data, information, and knowledge do not lend themselves to a linear progression. Yet in and of themselves, each of the terms within appropriate delimitations have a valid interpretation and application. Thus it is suggested that hierarchy be used as a context specific tool to clarify focused issues in the current discussion, and not be considered as a metainformational theory applicable uncritically to all contexts. The terms are polyvalent and ambiguous as terms, but manufacturing new terminology that might be more precise is not warranted either.

The first is John 6:35,63-64. "Then Jesus declared, 'I am the bread of life. Whoever comes to me will never go hungry, and whoever believes in me will never be thirsty. … The Spirit gives life; the flesh counts for nothing. The words I have spoken to you—they are full of the Spirit and life. Yet there are some of you who do not believe.'" Jesus used the metaphor of bread to represent His words and teachings. Bread is a commodity, and exists independent from the original producer and the potential user. It can be shared, passed from one person to another. But to be of benefit, it must be eaten. Once the bread is actually eaten, it is transformed and imparts strength and health to the one who eats. In the same way, "information" can be delimited as a commodity that exists equally for everyone prior to consumption. It can be passed around, shared, stored, and accessed. Once it is consumed by an individual, it becomes knowledge. It is believed and accepted as true by a consumer who then benefits.

The second Scriptural example of a conceptual boundary between "information" and "knowledge" is illustrated by the conversion of Saul as recorded in Acts 9. Saul had received the best in theological education. He later wrote, "I was advancing in Judaism beyond many of my own age among my people and was extremely zealous for the traditions of my fathers." (Gal 1:14). It can also be inferred that prior to his conversion, Saul had "information" about Jesus. He was present when Stephen gave his defense of the faith (Acts 7), and while relentlessly persecuting the Christians, he must have heard many testimonies about Jesus. Saul experienced all this, and had in his possession extensive "information" about Jesus, but he did not believe that Jesus had risen from the dead and ascended to heaven. He considered it a virulent form of "disinformation" that would undermine and destroy the true knowledge of God, and was taking action to protect what he accepted as true. But then Jesus spoke to Saul (vv. 4-5). At that

moment, Saul's perception of reality was transformed. Jesus was alive, and had spoken to him. What had been simply "information" was now "knowledge." He had eaten the "Bread of Life."

Of particular interest to the task of theological education is the one subsequent instruction given by Jesus to Saul during that epiphany. "Now get up and go into the city, and you will be told what you must do." (v. 6). The balance of Saul's education was assigned to the church. Everything else he needed to know would be learned from the community of faith in which he lived and worshipped. This is the mandate for theological education, and in this discussion, for providing appropriate information resources. This is the mission of the library. While no amount of "information" can replace that transforming acceptance of the reality of a living Jesus, a "knowledge" of the truth, yet providing access to valid, accurate, and reliable "information" is essential in the church's responsibility in preparing and mentoring its new leadership. Today that community of faith in which we live and worship includes the entire world, and theological education must be informed by the richness of intercultural and multiethnic contexts in which we collectively live.

To further the conversation on the place of the library in theological education, a second perspective on the transformation of Saul from an unbeliever to a believer in Jesus is suggestive. The story invokes the language of a "paradigm shift" in his "worldview." What does "knowledge" in the DIKW hierarchy sense accomplish? This speaks in turn to the role that providing information plays in this process.

Worldview has been defined as the "set of assumptions and commitments" with regard to a number of "fundamental issues." Raper, in a discipline specific context lists these as metaphysics, ontology, epistemology, philosophy of mind, linguistics, cognitive science, and

informatics.[4] In a religious context, ethics and axiology might be included. Saul's experience illustrates a radical change in his assumptions and commitments in each of these issues.

> For the message of the cross is foolishness to those who are perishing, but to us who are being saved it is the power of God. …Where are the wise? Where is the teacher of the law? Where is the philosopher of this age? Has not God made foolish the wisdom of the world? … Jews demand signs and Greeks look for wisdom, but we preach Christ crucified: a stumbling block to Jews and foolishness to Gentiles, but to those whom God has called, both Jews and Greeks, Christ the power of God and the wisdom of God. (1 Cor 1:18,20,22-24)

This Christ-centered worldview is articulated in the Gospel of John intentionally addressing these same core worldview issues. Metaphysics: "In the beginning was the Word, and the Word was with God, and the Word was God. He was with God in the beginning. Through him all things were made; without him nothing was made that has been made" (John 1:1-4). Ontology: "Jesus answered, "I am the way and the truth and the life" (John 14:6). Epistemology: "But when he, the Spirit of truth, comes, he will guide you into all the truth. … The Spirit will receive from me what he will make known to you" (John 16:13,15). Informatics: "Jesus did many other things as well. If every one of them were written down, I suppose that even the whole world would not have room for the books that would be written" (John 21:25). These brief statements summarize the metaphysical, ontological, epistemological, etc., foundations for understanding reality. One task of theological education is to articulate the worldview and mentor the formation of the leadership in training. It is all about power.

The challenge faced by the church is that competing worldviews influence an individual's perception of reality, including the perceptions and attitudes of the candidates for pastoral leadership roles. This is evident in the problems associated with the assimilation and discipleship

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[4] Jonathan Raper, *Multidimensional Geographic Information Science* (New York: Taylor & Francis, 2000), 5. Raper provides a concise and intriguing discussion of the worldview of geographic information science that goes beyond the straight forward assessment of data. It would be of value to articulate the worldview of SDA theology along the same lines.

of new converts, the retention of members, and many of the "theological" controversies that divide the churches. Each person has a worldview which tends to be absorbed from the social environment, unless these worldview issues are intentionally addressed and articulated. Thus those who grew up in the church may have a tacit initial advantage, but may be distressed and challenged when confronted by alternative worldviews.

The practical implication is that while each person may be observing the same data and information, their worldview filters and alters their perceptions. And when information comes along that cannot be made to fit into these expectations, it is either ignored, or the worldview is altered. When the worldview is socially absorbed and tacit, the individual is not equipped to evaluate effectively the challenges to it. Church leadership faces these situations routinely and must be trained to both answer the challenges to a Christ centered worldview, and to mediate that worldview to others. They are enabled to accomplish this task more effectively when they have access to accurate and reliable information. [5]

To illustrate the challenge in theological education in particular, two competing worldviews from the academic environment will be highlighted representing opposite extremes. The first is scientism. Epistemic scientism makes the claim that: "the only reality that we can know anything about is the one science has access to."[6] This is translated into academic circles as methodological scientism, "the attempt to extend the use of the methods of natural science to

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[5] Recent discussions and applications of worldview in a Christian context include: Paul G. Hiebert, *Transforming Worldviews: An Anthropological Understanding of How People Change* (Grand Rapids, MI: Baker Academic, 2008); James Porter Moreland, *Kingdom Triangle: Recover the Christian Mind, Renovate the Soul, Restore the Spirit's Power* (Grand Rapids, MI: Zondervan, 2007); James Porter Moreland and William Lane Craig, *Philosophical Foundations for a Christian Worldview* (Downers Grove, IL: InterVarsity Press, 2003); David K. Naugle, *Worldview: The History of a Concept* (Grand Rapids, MI: Eerdmans, 2002); James W. Sire, *The Universe Next Door: A Basic Worldview Catalog*, 4th ed. (Downers Grove, IL: InterVarsity Press, 2004).

[6] Mikael Stenmark, *Scientism: Science, Ethics, and Religion*, Ashgate Science and Religion Series (Aldershot: Ashgate, 2001), 4.

other academic disciplines in such a way that they exclude (or marginalize) previously used methods considered central to these disciplines."[7] When analyzed according to the worldview issues noted above, reality is limited to the physical world, and knowledge is limited to what can be perceived by the senses.[8] One area of study where the impact of this worldview is evident is in the question of origins. Creationism is not compatible and does not fit. Thus, when conflicting evidence that supports creationism is presented, scientism either filters or alters it to fit expectations. Some have taken this worldview and applied it in the disciplines of theological inquiry, one example includes the hermeneutical presuppositions of higher criticism as it emerged out of the Enlightenment, for example, the principle of analogy where the past is understood in the light of the present.

The second worldview is the postmodern reaction to scientism that has been labeled social constructionism. The basic concept is that all knowledge is socially constructed and contextually contingent. In introducing his critique of this worldview, Boghassian defines the concept:

> Especially within the academy, but also and inevitably to some extent outside of it, the idea that there are "many equally valid ways of knowing the world," with science being just one of them, has taken very deep root. In vast stretches of the humanities and social sciences, this sort of "postmodern relativism" about knowledge has achieved the status of orthodoxy. I shall call it (as neutrally as possible) the doctrine of *Equal Validity*: There are many radically different, yet "equally valid" ways of knowing the world, with science being just one of them.[9]

As this worldview has played out in the culture, traditional Christianity has been challenged. Maxwell summarizes the impact of this way of thinking as a transition from people

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[7] Ibid., 3.

[8] Moreland, *Kingdom Triangle*, 59.

[9] Paul Artin Boghossian, *Fear of Knowledge: Against Relativism and Constructivism* (Oxford: Clarendon Press, 2006), 2.

viewing themselves as religious to viewing themselves as spiritual. "People have granted to themselves the freedom to define what, if any, religion they will practice. No longer are individuals limited to the religion they were born into. Doctrine, church attendance, denominational loyalty, and a host of religious concepts that were the cornerstone of faith years ago hold little sway for most people today."[10] One example of an attempt to contextualize the Gospel for this worldview is the Emergent Church Movement.

If Paul were writing today, he could have rephrased 1 Cor 1:22-24 as follows: "Adherents of scientism demand evidence and adherents of social constructionism look for wisdom, but we preach Christ crucified: it may be just another story for the postmoderns, and foolishness to positvists, but to those whom God has called, those in the sciences and humanities alike, Christ is the power of God and the wisdom of God."

Socially constructed worldviews are attractive because they purport to deliver power to the person and to the society. However, each is flawed. Thus the tension between scientism and postmodernism could be described as a full-blown war, on a par if not more intense than the Science and Religion debates. The number of books and articles that have been published promoting the claims of one or the other, and then exposing the fallacies of these claims is staggering.[11] The point is that all these human centered worldviews cannot deliver any level of confidence, let alone certainty.[12]

On the other hand, a Christ-centered worldview provides a rich environment that fosters confidence. If pastors and church leadership are to effectively engage alternative worldviews, it

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[10] Nancy Kalikow Maxwell, *Sacred Stacks: The Higher Purpose of Libraries and Librarianship* (Chicago: American Library Association, 2006), 5.

[11] John Budd, *Knowledge and Knowing in Library and Information Science: A Philosophical Framework* (Lanham, Md.: Scarecrow Press, 2001), 91-93. Budd provides an historical survey of the debate.

[12] Esther L. Meek, *Longing to Know* (Grand Rapids, MI: Brazos Press, 2003), 137.

must be from a clear, articulated, Biblically sound position.[13] Formative pedagogy to accomplish this objective anticipates accessible information resources.

In relation to information theory, one critical function the construct of worldview serves is to delineate truth from error, and to articulate how these determinations are made. Stahl reviews this theme with an application to a critical research perspective. But because he is unable to define "truth" by drawing on current philosophical discussions, the concepts of information, misinformation, and disinformation become problematic for him. However, his conclusions are intriguing and perhaps applicable to the current discussion. "If we go back to the definition of information, then a relevant aspect is that it makes a difference, that it 'in-forms' people and helps them orientate themselves. Given that critical research is interested in emancipation, one can say that from the perspective of CRIS information is what helps emancipate humans, whereas misinformation and disinformation alienates and disempowers." [14]

Stahl's claims correlate with the role of information in the Biblical worldview. Jesus is "the way and the truth and the life," (John 14:6) and belief in Him emancipates and empowers. True information that leads to belief both 'in-forms' and transforms, and makes a difference.

A considerable portion of the Scriptures is devoted to addressing the problems of misinformation and disinformation, particularly with reference to the character of God. These problems are characterized by alienation and disempowerment. For example, Peter warns against false prophets and false teachers who "will secretly introduce destructive heresies, even denying the sovereign Lord who bought them" (2 Pet 2:1). But what the church has so often failed to

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[13] John Mathews Baxter, "A Model for the Development of a Bible-Based Worldview" (M.A. thesis, Andrews University, 2004).

[14] Bernd Carsten Stahl, "On the Difference or Equality of Information, Misinformation, and Disinformation: A Critical Research Perspective," *ISJ* 9 (2006): 91. CRIS refers to 'critical research in information systems.'

understand is that it is the Lord, not the church, who is responsible for holding "the unrighteous for punishment on the day of judgment" (v. 9). His exhortation to the readers is to "be on your guard so that you may not be carried away by the error of the lawless and fall from your secure position. But grow in the grace and knowledge of our Lord and Savior Jesus Christ" (3:17-18). In library jargon this 'being on guard' is labeled "information literacy," the ability to effectively find, evaluate, and use information.[15] Applied to church leadership, this competency is vital.

So to conclude this section, let me reiterate, "information" and the role it plays in theological education is indeed about "power."

THE ECONOMICS OF INFORMATION ACCESS IN THEOLOGICAL EDUCATION

The concern of the second part of this essay is addressing the economics of "power" distribution within the institution. It is a truism that the Seventh-day Adventist Church needs competent well-trained leadership in every part of the world. To this end, graduate level Seminaries are being established in each of the world divisions to meet the needs of their territories. Libraries are a core component of these institutions. But libraries are costly to build, fill, and maintain. Retrospective collecting is particularly difficult.

In North America, the Seventh-day Adventist Theological Seminary has almost seventy-five years of collection building, and has archived the creative and scholarly output of its faculty and students. In addition, the Center for Adventist Research, located on the campus, includes the premier collection of literature by and about Seventh-day Adventists. For students in the Seminary, there is a rich scholarly information environment that includes the best in Adventist

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[15] *Information Literacy Competency Standards for Higher Education* (Chicago: Association of College and Research Libraries, 2000).

scholarship. For the most part, however, this scholarship is in a paper based technology and cannot be accessed from off campus. Though the cost of digitizing equipment has become more feasible, the cost of labor to digitize these resources is still prohibitive, even if copyright permissions could be arranged. So the Adventist scholarly output of the last one hundred years is largely accessible only on site. This is great for the SDATS, but not much help for the rest of the global church.

The recently established Seminaries have had neither the cumulative time nor financial resources to build a comparable library. In some tropical settings, the preservation of books for more than a few years is impractical. Theological education in these institutions must work with what they have, often frustratingly little. One hope that has been promoted as a way to enrich the curriculum quickly is the promise of digital resources. The cyberinfrastructure has been continuously improving on these campuses, and access to the internet is now a graduate level resource for education in most countries.

This anticipation is warranted. The historic literature of Christianity that is in the public domain is largely available on the internet.[16] *Google Books[17]* has made the collections of some of the world's largest research institutions accessible online, with public domain titles available full text now.[18] Recent agreements between Google and publisher groups promise to also make the

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[16] For example see "Christian Classics Ethereal Library", Calvin College http://www.ccel.org/ (accessed May 11 2009); Robert E. Smith, "Project Wittenberg Lutheran Electronic Archive: Texts by and About Martin Luther and Other Lutherans", Concordia Theological Seminary http://www.ctsfw.edu/etext/ (accessed May 11 2009).

[17] "Google Books", http://books.google.com/ (accessed May 11 2009).

[18] "Google Checks out Library Books", Google Press Center http://www.google.com/press/pressrel/print_library.html (accessed May 11 2009). The original Google Five are Harvard University, the University of Michigan, Stanford University, the University of Oxford, and the New York Public Library.

full text accessible of out-of-print books still under copyright.[19] Since publishers can now anticipate financial remuneration for their works, it is predicted most will also make the full text of their in-print titles accessible. While university libraries in the North will be required to pay license fees to access this mega digital library, those located in the South will most likely not be required to pay, either because governments, aid organizations, or publisher goodwill are absorbing the associated costs. And that is just the book category of scholarly literature.

Scholarly communication also relies significantly on periodical literature. Journal publishers have gone digital. Aggregator services have made much of the journal literature accessible. While costly for libraries in the North, these have been made available through various means in the South. For theological education, the *ATLASerials* database[20] is the leading example, at last report (February, 2009) providing the full text of 138 leading disciplinary journals, and the list of titles is growing annually. In addition, many individual journals are archiving backfiles on the internet. *Andrews University Seminary Studies*[21] and *The Journal of the Adventist Theological Society*[22] are doing this. The General Conference of Seventh-day Adventists Archives[23] is making their holdings accessible online, including the *Review and Herald, Ministry Magazine,* and many of the division papers. Other forms of scholarly

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[19] Google, "The Future of Google Books: Our Groundbreaking Agreement with Authors and Publishers." http://books.google.com/googlebooks/agreement/ (accessed May 11 2009).

[20] American Theological Library Association, "ATLASerials® (ATLAS®)" http://www.atla.com/products/catalogs/catalogs_atlas.html (accessed May 11 2009).

[21] "Andrews University Seminary Studies", http://www.auss.info/ (accessed May 11 2009).

[22] Adventist Theological Society, "Journal of the Adventist Theolocial Society" http://www.atsjats.org/ (accessed May 11 2009).

[23] General Conference of Seventh-day Adventists Office of Archives and Statistics, "Online Document Archives" http://www.adventistarchives.org/DocArchives.asp (accessed May 11 2009).

communication that are open access on the internet are mushrooming, particularly in Europe, Australia, and India.

To summarize, the emerging technologies of cyberspace are globalizing information resources. Students in these new Seminaries, regardless of location but assuming some level of cyberinfrastructure, will have access to the theological literature of the ages and holdings of some of the largest libraries in the world.

From the consumer perspective, however, this is both a blessing and a curse. To illustrate, access to information is like access to food. For the subsistence farmer who struggles to find enough to eat, the academic discipline of nutrition is not relevant because they have no choice in what they eat. But the person who buys their food at a large urban grocery store is now held accountable by the discipline of nutrition for their food choices, many of which are made under the duress of massive advertizing campaigns. When students had access to only a few information resources, they did the best they could, and information literacy was not even conceived as an issue. But now the competencies of information literacy are essential because students must manage information overload, critically evaluate and select only the best sources, and then use them ethically to complete their learning assignments.

Information literacy, the ability to find, evaluate, and use information effectively, is the intersection where the economics and the mechanics of information distribution meet the understanding of how knowledge building and worldview formation in the education process take place. This is the consumer side of the economic equation.

The producer side of the economic equation is equally challenging, and the emerging cyber environment is impacting the publication process. Except for perhaps Scientific/ Technical/ Medical (STM) publishing, scholarly communication is largely university based.

University professors write scholarly monographs which are published by academic presses for whom university libraries are the primary market. The same applies to academic journal articles. These same university professors are motivated to write for publication because tenure and promotion criteria are largely based on publication history. Any personal economic rewards come more from the increases of salary from promotion, than from royalties on the sales of their books.

These writers are motivated and are producing prodigious amounts of scholarship. But the publishers are facing economic realities of their own. It takes considerable time and expertise to prepare a manuscript for publication, all of which takes place before a single book is sold. Printing costs and inventory expenses must also be accounted for before that first sale. Once the book is printed, there are considerable marketing expenses. All this is done in good faith that there will be enough end users who will be willing to pay enough cash to meet the initial investments in employee pay, printing expenses, and marketing costs. A publisher is taking on a considerable risk.

For advanced academic monographs, the primary market is the university library. These libraries are facing their own economic pressures. Book budgets have largely remained flat, in spite of inflation, and many smaller institutions are cutting back. The market from the publisher perspective is contracting.[24] So in order to remain financially viable, academic publishers are becoming much more selective and conservative in the manuscripts they accept for publication,

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[24] Cecile M. Jagodzinski, "The University Press in North America: A Brief History," *Journal of Scholarly Publishing* 40, no. 1 (2008): 16. "The continued erosion of library budgets, the open-access movement, the entrance of commercial entities such as Google and Yahoo into the academic realm, the requirement that presses break even without large university subsidies, new collaborations with libraries and other campus units – all these factors are now part of the university press environment."

and some are diversifying into general reader publishing.[25] For example, in order for Andrews University Press to publish a manuscript, the editors must reasonably expect to sell five hundred copies within two years. This objective rules out most advanced academic works that would be appreciated by only a few specialists, and would be purchased by only a few libraries. Also, Andrews University Press is diversifying into the general reader market by publishing a Bible with helps for the reader, thus hoping to be self-sustaining, and perhaps turn a profit.

In spite of this, emerging technologies are opening up some new possibilities for publishers. Wipf and Stock is developing an interesting catalog of original titles in theology using only print on demand technologies.[26] University of Michigan Press is moving to a model where they publish the full text of the work online, but print paper copies only on demand.[27] Walter de Gruyter has begun an author pay option. Once an article or book chapter has been accepted for publication, the author can pay to have it published open access, and the price of the paper copy is adjusted down proportionately.[28] Many authors prefer to have their work read in a global marketplace, perceiving that they will accrue more benefits from the status this brings

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[25] William W. Savage, "Too Many Cookbooks Spoil the Stupor," *Journal of Scholarly Publishing* 39, no. 2 (2008): 181-185. This wry editorial on a recent MLA report on the challenges of tenure and getting published in University Presses provides an ironic overview of scholarly publishing issues in the humanities.

[26] "Wipf and Stock Publishers", http://wipfandstock.com/ (accessed May 11 2009). "Wipf and Stock publishes new works in theology, biblical studies, church history, philosophy and related disciplines. Our vision is to publish according to the merits of content rather than exclusively to the demands of the marketplace." "By utilizing digital imaging and printing technology, Wipf and Stock has developed an innovative method of short-run production that allows for the fulfillment of orders within two to five business days. This enables Wipf and Stock to bring old titles back into print, to publish new works without heavy subvention, and to keep all of its titles in print indefinitely."

[27] Scott Jaschik, "Farewell to the Printed Monograph " *Inside Higher Ed* (March 23, 2009). http://www.insidehighered.com/news/2009/03/23/michigan (accessed May 11, 2009).

[28] "De Gruyter Open Library -- De Gruyter's Open Access Policy", http://www.degruyter.com/cont/glob/openAccessEn.cfm (accessed May 11 2009).

than from royalties. Some book stores and libraries are installing equipment that will print books in paper format on the spot in just a few minutes.[29]

While journals are adapting to cyberspace efficiently, the actual preparation of the content still requires the services of an editorial team. In academic circles, most of this work is accomplished by salaried professors who justify this activity as a scholarly contribution to their discipline. The editorial and printing costs have been met through modest subscription income and institutional subsidies. A current trend is that the actual publishing of the journal is shifting more and more from a local responsibility to commercial publishers who facilitate editing, printing and distribution, for a price. Andrews University edits both *Andrews University Seminary Studies* and the *Journal of Research on Christian Education*. *AUSS* is locally published and distributed, with an institutional subscription of $42, while *JRCE* is published by Routledge and the current institutional subscription of $209.[30]

Scholarly publishing is expensive. The current model places the burden on the end user to meet the direct costs. Institutions, mostly universities, are subsidizing the indirect costs of authorial and editorial time, justifying the expenses as warranted in the accrued prestige to the University for marketing and fundraising purposes, and in the improved competence of the author in their teaching functions.

In Seventh-day Adventist theological education, the conundrum is this. In order to provide the essential information resources that will mentor and support a well trained clergy in the Adventist context, the denomination cannot afford the production costs for a product that the

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[29] William C. Dougherty, "Print on Demand: What Librarians Should Know," *The Journal of Academic Librarianship* 35, no. 2 (2009): 184-186.

[30] "Journal of Research on Christian Education", Routledge http://www.tandf.co.uk/journals/titles/10656219.asp (accessed May 11 2009).

majority of end users cannot afford to purchase. Theological students as a social group are not known for their purchasing power, and rely on campus libraries for information resources. Using paper technology, existing Adventist publishers cannot afford to publish books and other resources that would meet the focused information needs of these new Seminaries because the market is too small. Even if it were somewhat possible to do this, many of the new Seminaries are located in regions where the local economy would not support the cost of purchasing the paper resources created in larger economies.

The more pressing challenge is that students now have virtually unlimited access to a broad spectrum of literature in religion and theology, so that the focused literature available from the perspective of the global Adventist worldview, from both North and South, is seriously underrepresented. While the primary sources from the early history of the Seventh-day Adventist Church are now readily available, current scholarship is challenged because market realities hamper the publishing of other than works, which for the most part, address the needs of a general readership rather than mentoring the pastor in training.

By default, much of the theological curriculum relies on publications from outside the Adventist worldview. While there is substantial correspondence between the Adventist worldview and many in the Christian world, it would still be to the Adventist Church's benefit to have its leadership mentored using a greater proportion of appropriate and reliable information resources consistent with its identity.

TIME TO RETHINK 'INFORMATION' IN THEOLOGICAL EDUCATION

To recap, the following are the key points of this discussion:

1. Knowledge growth, both in individual and corporate contexts, requires accurate and reliable information based on solid data.

2. Seventh-day Adventist theological education needs accurate and reliable information that is documented and published to train and mentor a knowledgeable leadership, who can then wisely guide the global church.

3. Because information resources that are used in the educational process do influence the worldview of the student reader, resources that are consistent with an Adventist Christ centered worldview ought to make up a significant proportion of the core curriculum materials used in theological education. These curriculum materials should be equally accessible to all students in all regions of the world.

4. Emerging digital technologies are making vast information resources available globally, including access to significant Adventist historical resources. These opportunities enrich the knowledge formation experience of students.

5. The paper based technology documentation of scholarly communication is becoming less sustainable, and these economic limitations hamper global distribution. A number of digital based solutions are being tested in the contemporary marketplace. These should be reviewed to find a sustainable option that meets the needs of Adventist theological education.

6. Valuable resources on the life, thought and practice of Adventism from outside North America are being lost because they are not perceived as valuable enough to preserve. Digitization is a practical method of preserving these documents, and having them available will contribute significantly to theological education efforts.

Action steps that can be taken to improve the collective documentation of Adventist scholarship and make it more accessible globally could include the following:

1. Publish digitally theses and dissertations completed in Adventist graduate education.

2. Set up a repository for the documentation of scholarly communication that is not formally published in journals or monographs, for example, conference proceedings, quality student works, etc.

3. Increase the number of peer reviewed, competently edited scholarly journals in areas of essential curricular focus, using sustainable digital publishing and distribution models.

4. Collaborate on classroom texts, distributed digitally, and licensed to print locally if preferred.

5. Digital publishing with print on demand for well edited, focused, scholarly monographs, published "according to the merits of content rather than exclusively to the demands of the marketplace."[31]

It is anticipated this will require rethinking scholarly publishing both from the perspective of the individual scholar/educator and from the perspective of the Seventh-day Adventist denomination corporately.

In the paper based economic publishing model the individual scholar operates largely as a soloist, seeking to make an original contribution, and works through the research process alone. A new model is the orchestra, each author making a unique contribution that is in harmony with

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[31] "Wipf and Stock Publishers".

and enhances the impact of the whole. This assumes editorial leadership, a clearly defined focus on audience, without compromising faithfulness to the mission of the Church.[32]

It also shifts the concept of remuneration and reward from direct compensation to indirect compensation. A standard book publishing contract includes the provision for royalties paid directly to the author. In practice, the royalties normally received for academic works are not substantive. Indirect compensation is generally more remunerative, and is realized through rank promotion, expanded opportunities, and at some institutions, including Andrews University, cash bonuses for scholarship. In the new model, any financial remuneration would be contextually mediated, but the indirect compensation would reflect a global impact.

It might be necessary to rethink information development and distribution from the corporate, denominational perspective. In the corporate financial administration of the Church, each institution is administered independently though still accountable to the whole. Each entity operates according to a budget that balances income and expenses. For example, James White Library purchases books from Andrews University Press out of a book budget assigned by Andrews University from denominational subsidies and tuition revenues. Andrews University Press then registers the sale as income, which supports the operations of Andrews University, including the book budget for the library. No cash *per se* has left the institution. In spite of the apparent redundancy, the wisdom of this practice balances corporate culture with local situations, and is effective in fostering accountability.

However, in order to provide equal access to corporate knowledge resources, the development of the information products and their distribution could be facilitated by accounting

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[32] This model is further discussed by Reigeluth in the context of the differences between Industrial Age and Information Age organizations. Charles M. Reigeluth, "What Is Instructional-Design Theory and How Is It Changing," in *Instructional-Design Theories and Models: A New Paradigm of Instructional Theory*, ed. Charles M. Reigeluth (Mahwah, N.J.: Lawrence Erlbaum, 1999), 16-17.

for the economic details at a global/corporate level rather than at a local level using a currency other than money. The emerging digital technologies are less cash dependent, though equally time dependent, and perhaps even more so, expertise dependent. Thus the shared library of curriculum resources supporting Adventist theological education could be located in cyberspace rather than at any one geographic location, with editorial operations as globally diversified as is the corporate Church. While the economy in a Southern nation might not support the cash expectations of scholarly publishing in a Northern nation, scholars and their institutions could conceivably contribute time and expertise comparable to institutions in the North. The economic model therefore would be based on time and expertise, rather than on the dollar. This would make every institution an equal partner, regardless of history or geography, and every academic employee would have the opportunity to be a contributor, regardless of history or geography.

CONCLUSION

How is the pursuit of knowledge to be organized?[33] How can we enrich and enhance Adventist theological education to prepare wise leaders, equipped for multicultural and global leadership? The contribution of this paper is to make the claim that scholarly communication, access to one another's work, distributed information, is one key measurable factor by which that objective can be accomplished. The North needs the insights and wisdom of the scholarship of the South, and vice versa. The West needs the insights and wisdom of scholarship of the East, and vice versa. In the past, technological and economic barriers may have limited the exchange of information, giving the North and West a hegemony of information power, but now those

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[33] Steve Fuller, *Social Epistemology*, 2nd ed. (Bloomington: Indiana University Press, 2002), 3.

barriers are shrinking. Scholars must learn from one another in order to lead the community of faith to become even more effective in fulfilling the role of in-forming and mentoring new leadership (Acts 9:6). And the meeting place might just be a library located in cyberspace. A global information power grid for Adventist theological education has become technologically feasible.

The impact of such a library would be immediate. It is anticipated that users, primarily the students, would welcome and value such a library. Theological educators would also appreciate the resource and the role it would play in student learning. As students graduated, and moved into leadership positions, they would be better equipped to deal wisely with the challenges they face.

However, producer inertia may be the greatest difficulty. On the one hand, it would be rhetorically suspect for a theological educator to question the wisdom of developing such a library. On the other hand, the commitment of time and expertise necessary to make a quality contribution to the library cannot be taken for granted. To move forward, we need to know what can be done to encourage, support, and facilitate potential authors in becoming contributors. How can the academic culture of Adventist theological education institutions be shaped to include this kind activity as a standard expectation?

Sustainability is another issue. It will require broad-based administrative support and long term commitments at each level of the organization, preferably from the outset.

In the context of Seventh-day Adventist theological education the core values for an application of information theory to the development and distribution of appropriate and reliable curriculum materials can be summed up in the words of Scripture:

"Jesus answered, "I am the way and the truth and the life "" (John 14:6).

"But grow in the grace and knowledge of our Lord and Savior Jesus Christ. To him be glory both now and forever! Amen" (2 Pet 3:18).

"Then Jesus came to them and said, "All authority in heaven and on earth has been given to me. Therefore go and make disciples of all nations, baptizing them in the name of the Father and of the Son and of the Holy Spirit, and teaching them to obey everything I have commanded you. And surely I am with you always, to the very end of the age"" (Matt 28:18-20).

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