

# Whitehead's Theory of Prehensions as Inclusive of, and Conducive to a Philosophy of Education<sup>1</sup>

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## I. Introduction: On the Links and Discontinuities Raised by Scholarship Between Whitehead's Theory of Prehensions and his Philosophy of Education

Over the last half century, scholars and philosophers of education have been debating whether Alfred North Whitehead has provided us with a fully thought out and systematic philosophy of education. Certainly, from 1911 to 1936, Whitehead wrote many essays pertaining to education, some of which were reprinted and placed together in *The Aims of Education and Other Essays* (1929) and a handful of others which were published in *Essays in Science and Philosophy* (1947). But all of these essays may be said to be capable of 'standing on their own', namely, they may be interpreted as individual depositions, not necessarily linked to each other, nor to a conceptual whole. For this reason, many scholars have concluded that Whitehead never wrote systematically on education. However, since it is widely held that Whitehead's *Process and Reality* (1929) is his *magnum opus*, many scholars have asked whether we may read, interpret, translate, use and/or apply the concepts and ideas therein for the purposes of setting forth a more systematic Whiteheadian philosophy of education. Subsequently, to varying degrees, scholars of education have made use of Whitehead's complex philosophical notions in their writings.

Starting in 1951, in his essay, "Whitehead's Views on Education," Henry Holmes notes that Whitehead has "not written about education extensively" (*Education*, 622) and that "neither *Process and Reality* nor *Adventures of Ideas* contains direct references to education as a process" (*Education*, 626).<sup>2</sup> As such, Holmes' essay concentrates mostly on the *Aims of Education* without venturing into his other works. Holmes provides little in the way of ideas as to how one may link Whitehead's thoughts on education to his other works and theories. However, Holmes does foreshadow that "it is not unlikely that his influence on education will have to come in part by indirection – through interpretation of his general theory" (*Education*, 622). Hence, from Holmes' perspective, Whitehead's philosophical writings may eventually prove to inform us of his views on education.

Likewise, in 1957, Frank Wegener also notes the same problem of linking Whitehead's respective writings on education and cosmology. Wegener writes that "although Whitehead did write and lecture on aspects of education, he did not apply his basic philosophical conceptions in

the overt formulation of a systematic organic philosophy of education” (*Organic*, 43-44). That is to say, for Wegener, Whitehead has seemingly left scholars of education no complete whole to refer to. Similarly, in the introduction to his much overlooked book, *The Organic Philosophy of Education*, Wegener raises the question of whether one may utilize Whitehead’s philosophy of organism for the purposes of elucidating his pedagogical views. Particularly, he asks if one logically turned

the question around it might be asked ‘to what extent would the Philosophy of Organism be in agreement with the ‘Organic Philosophy of Education?’ It should be clearly understood that discrepancies of interpretation, application, and emphasis would no doubt be very evident” (*Organic*, 36).

In such a case, one would find that Whitehead’s speculative metaphysics could definitely not be ‘contained in’ Whitehead’s perspective on education, thus refuting any logical equivalency between the two. But, Wegener does take quite a bold approach with respect to the idea of using Whitehead’s complex philosophical notions towards the construction of an organic, ‘process’ pedagogy. He utilizes the complex cosmological notions of *Process and Reality*, such as ‘creativity’, ‘prehension’, ‘concrecence,’ ‘subjective aim’, and ‘self-realization’, towards the construction of a truly novel and organic philosophy of education. At the same time, he maintains that while “the Organic Philosophy of Education is in substantial agreement with Whitehead’s philosophy of organism” (*Organic*, 35) he makes no “intimation (...) to convert the philosophy of organism directly into an equivalent educational philosophy” (*Organic*, 35). In any case, Wegener adeptly uses Whiteheadian concepts in order to overcome those previous theories of education which maintained rigid separations between the various notions of education, for example, between ‘teacher’ and ‘student’, ‘authority’ and ‘freedom’, and ‘academic’ and ‘experiential’.<sup>3</sup> As such, Wegener posits Whitehead’s cosmological notions as coextensive to education since he believes that life and experience comprise the real ‘classroom’ of learning. Specifically, for Wegener, “Education involves the blending of systematic ‘schooling’ and ‘life-experience’ in the total educational process” (*Organic*, 89) It is for this reason that when one approaches Wegener’s book, it seems, at least initially, tough to know where the philosophy of education begins with respect to Whiteheadian philosophy and where it ends. Wegener’s stance is admirable in its own right in depicting the connectedness between education and the rest of the organic universe, but it might be argued that scholarship on Whitehead’s perspective on education demands more clarity. Scholarship may demand more defined boundaries between what is practical with respect to

education and what is not. In any case, later in the book, Wegener claims that

by and large there is an educational philosophy implicit in Whitehead's philosophy of organism. Yet in order to make this philosophy of education explicit, one must bring a knowledge of the unique problems and content of the field of education, realized from one's study and experience, to the general philosophy in question (*Organic*, 324).

Thus, following from Wegener's reflections, it would seem that a philosophy of education is contained implicitly within Whitehead's general philosophical writings, but not vice-versa, and that in considering education, for example, in light of the theory of prehensions, some appeal to one's own experiences in education must be made. Later, in this paper, these important notions will be considered further.

In the mid-1960s, Harold Dunkel further raised the issue of the relationship between Whitehead's writings on education and his general philosophizing in his book, *Whitehead on Education*. According to Dunkel, Whitehead's interest in education

stemmed from being an educator in the same sense as are all professors who are sincere and conscientious about their professional duties. His educational writings are scattered essays. He never attempted to publish a specific philosophy of education or to train teachers in it. (...) One may then ask why, apart from certain brief essays on Whitehead's educational position, no extended attempt has been made to use his general philosophy as a basis for educational thought and action (*Education*, 7-8).

Therefore, in Dunkel's analysis, since Whitehead himself made little attempt to link his views on education with his cosmology and made few references to the theory of prehensions in his writings on education, the question might be raised as to why scholars would want to attempt to make the connection. Moreover, Dunkel, writes that since Whitehead

never presented his educational ideas in one organized, coherent statement (...) (there is the) question whether his views on education represent only scattered insights and comments or whether they actually form a coherent whole. (...) The question(s) immediately arise (...) whether the views expressed in these earlier educational essays are congruent with (or even related in any way to) his more mature philosophic enterprises (...), whether there is any relation possible between general philosophic theory, on the one hand, and educational theory, ideas, and practice, on the other, (...) (and) whether there is any significant connection (between them) (*Education*, 9-10, my additions).<sup>4</sup>

With these problems in mind, Dunkel carefully maintains a focus primarily on the *Aims of*

*Education*, while, at the same time, making reference to many of the key philosophical themes of Whitehead's other writings that may influence or that implicitly pertain to thought on education. Education, for Dunkel, is connected with the processes Whitehead describes in his general philosophizing, and tends "to have moments or aspects which correspond to parts of this process" (*Education*, 103). Specifically, Dunkel points to the process of learning described as a 'self-development', which, as he surmises, may be analogous to the process of concrescence of an actual entity as described by Whitehead in *Process and Reality*. Similarly, Dunkel defines that the purpose of education in general is to assist such self-development. In this direction, Dunkel feels that Whiteheadian cosmology could offer us a "comprehensive conceptual matrix" (*Education*, 20) within which a philosophy of education could be elaborated. And he argues that educators should become more interested in philosophy so as to carry out this task. Dunkel concludes that "the correspondence between Whitehead's philosophic doctrine and his educational views appears both extensive and fundamental" (*Education*, 170). But, it would still seem that Dunkel is more reserved than Wegener in merging Whitehead's views on education with his cosmology.

Recently, Malcolm Evans, in *Whitehead and Philosophy of Education* (1998) has, at length, raised similar questions regarding the possible use of Whitehead's general philosophy for the purposes of education. He asks,

in much of his formal philosophy, Whitehead is writing about ideas that are indispensably relevant to the universe. What are the ideas in his metaphysics that are indispensably relevant to our lesser universe – education and schooling? (...) Do such ideas as creativity (...), prehension, concrescence, satisfaction, etc... fit into education? (*Evans*, 98)

In attempting to answer these questions, Evans' book serves as a useful introduction to understanding Whitehead's perspective on education. He elaborates on many previous commentators' approaches to the question of the possible connection between Whiteheadian cosmology and philosophy of education. In the text, Evans uses Whitehead's formal technical vocabulary in his discourse on education in a generalized manner. From Evans' perspective, Whitehead's writings on education and philosophy must be joined together, for "those who would seek Whitehead, philosopher of education, must examine all of his writings" (*Education*, 34). In this direction, Evans endeavours to "tap both formal and informal philosophies for the rich insight they provide and to draw out the implicit philosophy of education found there" (*Education*, 34).<sup>5</sup> He recommends that we read Whitehead's 'formal', or more systematic writings with a view to applying them to education since "Whitehead's metaphysical writings, although far removed from traditional educational theory,

provide a new and *necessary frame* for thinking about education and its societal setting” (Evans, 49, my emphasis). Thus, for Evans, Whitehead’s metaphysical writings provide a cosmological framework within which a philosophy of education may be situated. But, for him, the task of constructing a more complete Whiteheadian philosophy of education or of “unpacking” (*Process*, 5) one from Whitehead’s speculative metaphysical writings are tasks which have yet to be carried out.<sup>6</sup> Evans’ book provides an excellent preparation for such an endeavour.

Certainly these four writers do not represent the whole history of scholarship on the question of linking Whitehead’s philosophy of education and his speculative metaphysics. For many others, who have not been acknowledged here, have pondered the question extensively and have made valuable contributions on the issue.<sup>7</sup> The question is the perennial starting-point for enthusiasts of Whitehead’s philosophical writings who are adventuring into the domain of education. However, from this particular sampling of scholars, it is evident that there is a general variance between them in responding to the question of the link between Whitehead’s speculative metaphysical writings and his views of education. While some endeavour to connect Whitehead’s writings on education with his general philosophizing, others are more reserved in doing so. In the present article, I further discuss some of the intrinsic connections and discontinuities that may be pointed out between Whitehead’s thoughts on education and his general speculative philosophy. Particularly, in this paper, I ask: may one read and interpret Whitehead’s cosmological scheme as a philosophy of education?

In response to this question, I show how interpreting Whitehead’s overall cosmological scheme simply as a philosophy of education might be seen to be problematic. However, I defend the view that the theory of prehensions, while a central part of Whitehead’s cosmology, is both inclusive of, and conducive to a philosophy of education. That is to say, I hold that Whitehead’s philosophy of education can be found not only in his writings on education, but it is also implicitly to be found within the theory of prehensions. And I argue that an elaboration of Whitehead’s theory of prehensions most logically leads to a consideration of education and learning. In other words, a consideration of education and learning is a logical progression of reflection stemming out of the theory of prehensions.

In order to defend these claims, it will be first necessary to point out some of the problems of directly linking Whitehead’s general philosophizing with pedagogical considerations. However,

second, I shall elaborate on Whitehead's notion that speculative philosophy be applicable. Third, I shall discuss Whitehead's own comments regarding a possible analogy between his views on education and his general philosophizing. Fourth, I shall make reference to the fact that Whitehead's theory of prehensions may find its context amidst educational psychology of the twentieth century. Fifth, I shall briefly discuss some basic similarities between Whitehead's theory of the 'Rhythms of Education' and the theory of prehensions. Sixth, it will be necessary to discuss the underlying link between John McMurtry's definition of education and Whitehead's central notion of 'conrescence'. Seventh, I shall investigate whether or not there is a critical 'process' pedagogy implicit within Whitehead's theory of prehensions.

## **II. Why Directly Linking Whitehead's Pedagogical Writings and His Overall Speculative Cosmology Might Be Seen to be Problematic**

In this section, I elaborate on three reasons why directly linking Whitehead's writings on education and his overall speculative scheme might be seen to be problematic. First, as many scholars have pointed out, Whitehead himself does not explicitly spell out the relationship between his views on education and his general philosophy. For example, if Sherburne's and Griffin's index is accurate, the word 'education' appears in *Process and Reality* only twice.<sup>8</sup> Neither of these statements, while important, support a direct link between his general philosophical writings and his views on education. In fact, they point out that the endeavour to provide an overriding formal philosophy of education, in which prospective teachers are to be trained, is doomed to 'stifle imaginative zest' in the classroom. In this case, by being immersed dogmatically into an all-encompassing philosophy of education, professors might end up teaching from flash cards, instead of letting their interactions with their students be spontaneous and individual. The issue of such dogmatism could perhaps be one reason why Whitehead did not make the effort to set forth a strict philosophy of education. Hence, there are very few examples which point to any analogy between education and his overall cosmological scheme, and some which critique the endeavour to provide an overriding philosophy of education. However, the best example made by Whitehead that I have

found, which points to the link between the two, will be considered in section four of this paper.

Second, the view set forth in Wegener's *The Organic Philosophy of Education* that Whitehead's cosmological scheme is coextensive with education, is definitely a tough position to 'sell' to scholars of education. It is true that all the manifestations of life and experience contribute to the education of an individual, and similarly, we should seek to include the metaphysical and spiritual dimensions of life into education. But, in education, we want to concentrate on the relevant practical terminology of the university and the school-system of which we are familiar, for example, 'teacher', 'student', 'curriculum', 'administration', etc.... It might further be argued that Whitehead's cosmology is largely directed by scientific terminology describing organic processes in the natural world, which has little to do with education. And, consequently, it may be maintained that the vocabulary of education is quite different from the terminology describing purely organic processes, such as in biology: 'cells', 'cell reproduction', or 'symbiosis'; or in chemistry: 'molecular structure', 'sublimation', or 'molar mass'. Therefore, on the one hand, education is not one-sidedly a model for these biological and chemical processes in nature, for that would be a form of anthropocentrism: namely, of attributing the human to the natural world. On the other hand, these biological and chemical processes do not one-sidedly provide a model for education, a view that would completely reduce the human to the natural world. In all fairness, I have myself attended imaginative high school chemistry classes where students were made to take the roles of different types of molecules and atoms. We were then made to bump into each other, to separate ourselves, and to pack ourselves tightly together, in order to mimic chemical reactions and to provide a vivid (if not a 'mosh-pit') account of actual chemical processes. Certainly, Whitehead would want to point out that education has many things in common with these natural processes and that there is no necessary separation between them, but it should equally be pointed out that there is also no necessary connection between them either. Thus, while we may import some terminology from each side into the other, we should generally use the practical terminology of education to describe educational process and the practical terminology of biology to describe biological process. That is to say, we should not merely use some abstract set of scientific terms that are not

relevant to a practical discussion of education. Therefore, let us admit, at least provisionally, some valuable connections and maintain some important divisions between Whitehead's speculative scheme and his views on education.

Third, as has been previously described, it has been argued that even Whitehead's non-scientific philosophical terms are quite abstract and that they do not lend themselves well to the terminology of education. To be sure, connections are not very evident. For example, even if Whitehead's system was framed in a vocabulary which is easy to grasp, terms like 'transmutation', 'subject-superject', and 'consequent nature of God' would seem, at least initially, to have very little to do with education. However, in the next sections, I shall point out some connections between some of Whitehead's basic terms and the processes in play in his cosmology which more easily lend themselves to the purposes of education. Specifically, it will be found that the theory of prehensions is actually quite relevant to education and educational theories of the twentieth century.

### **III. Whitehead's Insistence That Cosmology Be Applicable**

In his philosophical writings, Whitehead insists that his cosmology is applicable to many domains of thought. This insistence can be seen on the first page of Part One of *Process and Reality*, entitled, 'The Speculative Scheme', where Whitehead defines the terms that he will use in his elaboration of his philosophy of organism. He writes,

Speculative philosophy is the endeavour to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted. By this notion of 'interpretation' I mean that everything of which we are conscious, as enjoyed, perceived, willed, or thought, shall have the character of a particular instance of the general scheme. The philosophical scheme should be coherent, logical, and in respect to its interpretation, applicable and adequate. Here 'applicable' means that some items of experience are thus interpretable, and 'adequate' means that there are not items incapable of such interpretation (*Process*, 3).

From this quotation it is clear that Whitehead believes that every element of our experience may

be considered as a part of the speculative scheme, and that ‘educational experience’ cannot be omitted. In fact, Whitehead maintains that all forms of experience must be able to be interpreted in the cosmological scheme. In *Adventures of Ideas* he writes,

In order to discover some of the major categories under which we can classify the infinitely various components of experience, we must appeal to evidence relating to every variety of occasion. Nothing can be omitted, experience drunk and experience sober, experience sleeping and experience waking, experience drowsy and experience wide-awake, experience self-conscious and experience self-forgetful, experience intellectual and experience physical, experience religious and experience sceptical, experience anxious and experience care-free, experience anticipatory and experience retrospective, experience happy and experience grieving, experience dominated by emotion and experience under self-restraint, experience in the light and experience in the dark, experience normal and experience abnormal (*Adventures*, 226).

Therefore, it is logical for us to make the inference that we are to include ‘educational experience’ in Whitehead’s speculative philosophical writings amidst other forms of experience and other domains of thought. The only question is how this is the case. In the next sections, I shall provide a case for the notion that education is a domain to which Whitehead’s speculative scheme is most logically applicable, especially with respect to Whitehead’s theory of prehensions. That is, I will attempt to show how the theory of prehensions is conducive to education.

#### **IV. Whitehead’s Statement of the Analogy Between Educational Philosophy and The Theory of Prehensions**

In the *Aims of Education*, Whitehead gives one of the most obvious statements of a possible analogy for the inclusion of the domain of education within the theory of prehensions. He writes,

Education is not the process of packing articles in a trunk. Such a simile is entirely inapplicable. It is, of course, a process completely of its own peculiar genius. Its nearest

analogue is the assimilation of food by a living organism: and we all know how necessary is palatable food under suitable conditions. When you have put your boots in a trunk, they will stay there till you take them out again; but this is not at all the case if you feed a child with the wrong food (*Aims*, 33).

From this amusing passage, it is clear that Whitehead is making an analogy between education and the definition of what a 'prehension' is. For both are compared by Whitehead to the 'assimilation' or the 'appropriation' of food by an organism. Whereas 'assimilation' designates 'taking something in and making it part of the thing it has joined', a 'prehension' designates an actual entity's feeling of, and appropriation of the elements in its environment for the sake of its own existence. To be sure, Whitehead writes that by way of 'prehending' its environment, that "for the foundation of its own existence" (*Process*, 219), the organism feels and appropriates "the various elements of the universe out of which it arises. Each process of appropriation of a particular element is termed a prehension" (*Process*, 219).<sup>9</sup> In short, it might be said that whether Whitehead is talking about learning or experience in general, he is making the analogy of human learners to 'prehending' organisms. Learning is comparable to the depiction of an organism's feeling and absorption of the multifarious data of the environment into itself, contained in the theory of prehensions. In the passage above, Whitehead is, at the very least, hinting to us that there is an inclusive connection between education and the theory of prehensions. As he states, education's 'nearest analogue' is organic assimilation, as in 'prehension'. Hence, this statement definitely supports the conclusion that education is a domain that may find some explanation within the theory of prehensions and, furthermore, that a consideration of the theory of prehensions leads directly to a reflection on education.

## V. The Theory of Prehensions and Educational Psychology of the Twentieth Century

One way in which Whitehead's theory of prehensions may be claimed to be inclusive of, and conducive to an educational theory, is in its depiction of the relationship between feeling and consciousness. While the theory of prehensions is primarily a 'theory of feelings', it demonstrates that feeling and cognition are connected, rather than being strictly opposed. As such, the theory of

prehensions may be seen not only to locate itself within the context of cognitivist and behavioral theories of educational psychology of the twentieth century, but also, to a large extent, synthesizes and overcomes these competing points of view. On the one hand, the fundamental aims of education for biologist and psychologist, Jean Piaget, and for the cognitivists are the development and progress of cognition in the organism, emphasizing mental functioning, intellectual certitude, linguistic ability, rational problem-solving, decision-making, interpretation, memory, analysis, doubt, criticism, and conceptual differentiation. To be sure, in his educational theory, Piaget emphasizes the activities of education which are most conducive to “developing the critical attitude of mind, objectivity, and discursive reflection” (*Science*, 180).<sup>10</sup> On the other hand, the behaviorists emphasize sensory receptive mechanisms, emotions, feelings, stimuli, responses, and conditioning to reinforcement and to punishment in education.

It might be said that the history of the psychology of education is one largely based on variances on the interaction between cognitivist and behaviourist themes: most particularly, on the development and progress of consciousness and its interrelationship with stimuli, feelings, and emotion. According to Piaget, the development of the structures of consciousness is based in processes of conditioning or adaptation, namely, in processes of assimilation and accomodation. While assimilation “involves the interpretation of events in terms of existing cognitive structure, (...) accomodation refers to changing cognitive structure to make sense of the environment” (*Overview*, 1). In other words, by way of adaptation, the learner *qua* learner, through its reaction to events of experience, either attempts to mold the environment to herself or endeavours to modify herself in order to adapt to the environment. Subsequently, in cognitivist theory, the development of consciousness is part and parcel of the interplay of assimilation and accomodation, including the process of the organism’s integration of emotions and feelings.

Placed in context with the cognitivist and behaviourist theories in educational psychology, the theory of prehensions may be said to depict the non-linear process of intellectual development, starting from primitive bodily feelings and ending with consciousness. In it, Whitehead describes the process by which consciousness is developed out of our basic feelings of, namely, our

appropriation and assimilation of the elements of the world in which we live, and help compose. By way of his theory of prehensions, Whitehead outlines reasons for his belief that feeling is more primitive than consciousness with regards to the organism's experience of the world. For Whitehead, consciousness is primarily a high-level form of experience belonging to high-grade organisms, such as human beings. That is to say, while much of the experience of the lower animals is primarily the feeling of the external world, on occasion human beings have the mental capacity to select, negate<sup>11</sup>, and judge, which are, for him, the main mental operations which contribute to our having consciousness.

To be sure, according to Whitehead, "negation (...) is the peculiar characteristic of consciousness" (*Process*, 274).<sup>12</sup> In Whitehead's theory, being conscious of something implies that one 'objectifies' or posits an object out from the backdrop of the extensive continuum, or, alternatively stated, the effectively undivided universe. Such objectification involves both positive and negative prehensions, involving the appropriation of relevant data and the elimination of irrelevant data from experience. Particularly, Whitehead defines consciousness as "how we feel the 'affirmation-negation' contrast" (*Process*, 243). In other words, consciousness implies selectivity, which is comprised of a fluctuating interplay of operations of negation in virtue of affirmation, and affirmation in virtue of negation, which is intrinsic to the process of positing objects and making judgements in general.

In essence, Whitehead argues that the attainment of consciousness is important to the fulfillment of human potential, to self-realization, and to education in general. But, at the same time, he makes the case that it is equally important to step back from such high-level experience and return to the primitiveness of feelings, to experience basic 'animal' enjoyment, and to re-affirm the basic interconnectedness of the world. To be sure, Whitehead states that "the right coordination of negative prehensions is one secret of mental progress; but unless some systematic scheme of relatedness characterizes the environment, there will be nothing left whereby to constitute vivid prehension of the world" (*Process*, 254).<sup>13</sup> Here, assuming that the aim of education is the development of consciousness, Whitehead is arguing for a 'step back' from the abstractions of

consciousness (with its excessive emphasis on negation) in order, once again, to embrace the basic connectedness of the universe in general.

It would suffice to say that, whether or not we agree with Whitehead in his description of the ‘high-level’ nature of consciousness, the theory of prehensions may be understood as an overcoming of the debate between various educational psychologies of the twentieth century. Specifically, Whiteheadian philosophy demonstrates how both cognitivism and behaviourism are one-sided in nature. While the cognitivists’ emphasize feelings and emotions only in virtue of their subordination to consciousness<sup>14</sup>, the behaviourists subordinate consciousness to the conditioning of the environment. In this way, the theory of prehensions may be interpreted to be implicitly inclusive of a philosophy of education, since it leads directly to a consideration of the basic themes of twentieth century educational psychology. Furthermore, from the standpoint of education, the theory of prehensions speaks to us of the interrelation between body and mind. With respect to learning processes, it articulates both the necessity of developing consciousness, as well as the need to enhance our primordial preconscious awareness of the world through feelings.<sup>15</sup>

## **VI. A Brief Comparison of Some of the Themes in the ‘Rhythm of Education’ and in the Theory of Prehensions**

Whitehead’s threefold outline of the ‘Rhythms of Education’, involving the cyclic stages of mental growth: 1.) romance, 2.) precision, and 3.) generalization, has a remarkably similar structure to the theory of prehensions.<sup>16</sup> First, for Whitehead, is the stage of romance, which involves an original first-step into intellectual inquiry. It is the stage of “first apprehension” (*Aims*, 17), of wonder and curiosity, and of first interrogative stirrings in the body and mind regarding a particular subject matter. At this stage, the student enjoys the freshness of inquiry into a discipline, namely, the positive feeling that one is about to embark upon the adventure of learning, and perhaps an ‘initial aim’. The stage of romance accentuates the affective dimensions of learning: involving bodily feelings and emotions, be they positive or negative, for example, as in the case of fear, anxiety, or dread. Second, the stage of precision involves the analytic engagement with the specific principles of a subject-matter. Mainly, the stage of precision consists in the coming

to conscious awareness of the conceptual divisions within a domain of investigation. Similarly, as Whitehead states, it emphasizes the “exactness of formulation” (*Aims*, 18). In other words, the stage of precision is the stage of the development of specialized knowledge through analysis, negation, critique, and selection, which, as Whitehead maintains, are intrinsic to the development of consciousness. Third, the stage of generalization is the application of the specific conceptual divisions learned through the stage of precision, creatively modifying them into something new, and applying them to concrete fact. It is the stage of satisfaction and of aesthetic experience, namely, of the awareness of logical contrasts. Particularly, the stage of generalization involves the conversion of exclusions made in the stage of precision into contrasts. It involves the merging and the comparison of the feelings originally experienced in the stage of romance with the conscious awareness of the subject-matter attained through the stage of precision. The stage of generalization also leads to “a return to romanticism” (*Aims*, 19) after the acquisition of a specialized knowledge, representing ‘progress’ in learning. One of Whitehead’s main claims is the notion that education must be attentive to each of the rhythms of learning, and must not neglect any one of them in virtue of another.

In light of Whitehead’s elaboration of the rhythms of education, it is evident that the theory of prehensions depicts the process which generally follows a similar pattern.<sup>17</sup> Initially, as described in the theory of prehensions, there is experience characterized by the broad physical feeling of the interconnected environment. But, through subsequent selection, interpretation, and integration of felt data through conceptual operations chiefly involving negation and judgement, the organism’s awareness of its environment is raised to consciousness. Subsequently, having experienced the conceptual wealth of the higher conscious experience of its environment, it is implied that the organism attains some measure of satisfaction, then ‘steps back’ down to the level of physical feeling and purposes, to begin the prehensive process anew. Thus, from a generalized perspective, Whitehead’s depiction of the ‘Rhythms of Education’ generally coincides with the pattern pertaining to the development of consciousness in the theory of prehensions. And, the theory of prehensions perhaps offers a more technical and precise way of elaborating the ‘Rhythms

of Education’, another supposition which may support the notion that a philosophy of education may be found implicitly within the theory of prehensions.

## VII. The General Connection Between the Underlying Meanings of ‘Education’ and ‘Concrescence’

In order to further defend the inclusive connection between education and Whitehead’s theory of prehensions, one may make an appeal to the underlying meanings of ‘education’ and Whitehead’s notion of ‘concrescence’. For John McMurtry, the Latin root of ‘education’ is not, as commonly held, *educere* meaning ‘to lead out’, which presumably designates a ‘leading out of darkness’. Rather, McMurtry states that the true meaning of education is to be found in its alternative root: *educare*, which means, to cause or more preferably, to *enable* “to grow” (*History*, 39).<sup>18</sup> The words ‘to enable’, with respect to the growth of the learner, are to be preferred since ‘cause’ may imply technological instrumentality, an interpretation which is also not desirable.<sup>19</sup> Rather ‘enabling’, ‘fostering’, or ‘assisting’ growth thoroughly designates the organic meaning of education.<sup>20</sup> To be sure, Whitehead holds that the student’s mind is a ‘growing organism’, as well as elaborates on the importance of the student’s freedom to direct his own learning, in contrast to an instrumental method of teaching and classroom discipline. He writes,

the pupil’s mind is a *growing organism*. On the one hand, it is not a box to be ruthlessly packed with alien ideas: and, on the other hand, the ordered acquirement of knowledge is the natural food for a developing intelligence. Accordingly, it should be the aim of an ideally constructed education that the discipline should be the voluntary issue of *free choice* (*Aims*, 30, my emphasis).

Education defined as an ‘enabling the learner to grow’ resonates with Whitehead’s organic theory of prehensions with its chief notion of ‘concrescence’. The process of ‘concrescence’ or ‘growing together’ of actual entities<sup>21</sup> depicts how an actual entity / occasion becomes fully integrated into the internal constitution of a prehending subject. And whether the actual entities involved are a subject and a given object, a learner and a subject-matter to be learned, or a student and a teacher, ‘concrescence’ depicts the process of their ‘growing together’. In other words,

the process of prehension or appropriation of an object into consciousness, or alternatively, the ‘objectification’ of an actual entity, implies the self-realization or ‘subjectification’ of a learner.<sup>22</sup> Hence, subject and object, a learner and a subject-matter to be learned, or a student and a teacher may be said to ‘concrese’ or ‘grow together’.<sup>23</sup> From this perspective, the definition of education in terms of organic growth logically supports the thesis that the theory of prehensions is both inclusive of, and conducive to a philosophy of education.

### **VIII. Selectivity as a Main Theme in Whitehead’s Writings on Education and in the Theory of Prehensions: A Critical Process Pedagogy ‘Within’ the Theory of Prehensions?**

In “The History of Inquiry and Social Reproduction: Educating for Critical Thought,” McMurry advances a critical pedagogy towards the goal of instilling critical inquiry into the educational system. McMurry argues that whenever anything is learned, it is always accompanied by, or is the product of critical inquiry. He states, “human learning in the species sense develops in proportion to the extent that ... critical intelligence is able to flourish” (*History*, 33). Critical inquiry is defined as a process of *interrogation*, which discloses the nature of, the contours of, and the internal problems within the specific functional makeup of objects, having the aim of overcoming prior understandings of such objects. As McMurry describes, it is a process of “question posing (which) not only reveals the shape or nature of what is, but also reveals what is problematic with what is, what calls for reconstruction of position or fact to achieve some more adequate understanding or action” (*History*, 31). Critical inquiry is a process of questioning, revealing<sup>24</sup>, criticizing and reconstructing; a critical pedagogy involves harnessing the learner’s potential for critical thought and developing his conscious awareness of a specific subject-matter, for example, of social relations. For in McMurry’s view, critical inquiry ‘enables’ intellectual ‘growth’, which, as we have seen is, for him, a more adequate meaning of ‘education’ (Latin, *educare*).

In connection with McMurry’s project of instilling a critical pedagogy into the educational system, Whitehead’s theory of prehensions may provide a descriptive framework for a critical ‘process’ pedagogy with the initial aim of cognitive development in the ‘learner’. For a main theme

in both Whitehead's writings on education and in his theory of prehensions is organic selectivity, of which negative prehensions play a major role. Organic selectivity involves the fluctuating interplay of positive and negative prehensions, present at each stage of concrecence. While prehensions of the positive sort involve the positive appropriation of data, negative prehensions are the dismissal of irrelevant data. Selectivity is the cooperation of the two sorts of prehensions involving the notion that appropriation operates in virtue of elimination from experience and vice-versa. For the purposes of education, selectivity may be interpreted to be a central element in the growing together of teacher and learner.

At the one pole, from a Whiteheadian perspective, the aim of teaching as 'enabling' the growth of the student, is directed by selectivity. On the one hand, for Whitehead, teaching is not simply the idle dissemination of inert data or ideas. In other words, the concepts that are taught should be relevant and important to the student's lives. In Whitehead's perspective, teaching should involve the selection of facts and materials that are 'alive' and relevant. It includes the construction of a particular learning environment by way of a selection of themes, texts, units, and points of evaluation, namely, a selection of the curriculum to be taught.<sup>25</sup> It includes the selection of the concepts and particular data to be taught, in order that they be palatably presented, easily appropriated, owned, and creatively modified by the student. Also, the teacher's evaluation of the students involves the criticism of students' work and, by way of grades, 'selects' those students who have appropriated, creatively modified, and applied the subject-matter well.

At the other pole, from a Whiteheadian perspective, the student's growth is also directed by selectivity. For Whitehead, learning is not simply the regurgitation of the subject matter as presented by the teacher. Rather, it involves a critical engagement with, and selectivity within the subject matter. It consists in the students' selection of courses, the selection of information that he or she takes down in the form of notes, in the selection in virtue of the criticism of various conceptual perspectives presented by the teacher, and in the application of the material to selected logical subjects. In other words, selectivity via negation and judgement is a chief element in the development of cognitive awareness and in the learning of a specific subject-matter.

While negation and selectivity are main elements in the development of conscious awareness and in learning a subject-matter, as was mentioned earlier, Whitehead's theory of prehensions also endeavours to provide the step back from consciousness to feelings. Thus, while a Whiteheadian process pedagogy will be a critical pedagogy, it is definitely not an instrumental one. In other words, the implementation of a Whiteheadian process pedagogy would not allow the overstatement of negation and consciousness to exist. By elaborating on the passage from feeling to consciousness in the learner, as well as the step back, a Whiteheadian process pedagogy has the power to overturn the current state of affairs in which a 'destructive' pedagogy holds sway. A 'destructive' pedagogy is a critical pedagogy which over-emphasizes criticism and negative feedback on students' ideas and work. 'Destructive' pedagogy, has most probably arisen out of today's 'deconstructionist'<sup>26</sup> culture, which aims at attacking all metaphysical constructs and suppositions whatsoever. It is a predominant educational method employed today by teachers of various levels of the school system, including higher learning. The 'destructive' pedagogical method is one in which teachers use instrumental means, namely, constant and unbridled criticism, unjustified negative evaluation, the over-challenging of, and the continuous demanding for justification from their students, in order to 'cause' the conscious awareness of the subject matter taught.

Essentially, a 'destructive' pedagogy forces the student to adapt to a negative intellectual environment. The attritional method of the 'destructive' pedagogy, as a complete repudiation of compassion and the nurturance in education, is summed up well by David Hume's statement that "it is an infinite advantage in every controversy to defend the negative" (*Immortality*, 331). However, from a Whiteheadian standpoint, this overridingly negative pedagogy might be characterized as an attempt to "destroy wonder" (*Aims*, 32) and as "soul murder" (*Aims*, 57).<sup>27</sup> That is to say, it does not allow students to follow a paced and manageable path towards educational self-realization. Instead, the destructive technique attempts to educate students by way of inciting them by way of negativity to make conscious judgements regarding a certain issue. And it wrongly encourages students to interrogate their peers with the same type of destructive negativity.

In contrast, a Whiteheadian process pedagogy stemming from a reading of the theory of prehensions and the ‘Rhythms of Education’ could possibly be a framework from which to argue against such a destructive educational method, while at the same time maintaining the important elements of a critical pedagogy. A critical, process pedagogy would be one in which students would be relieved of their instrumentally motivated charge towards consciousness and precision. Thus, a critical, process pedagogy would alleviate the excess of negativity found in ‘destructive pedagogies’. But, it would also be critical of pedagogies deficient in negativity, namely, those training students to be intellectually passive, for example, as in the ‘banking-model of education’<sup>28</sup> characterized by Paulo Freire. Furthermore, it would be one in which there could not be any overstatement of any of the three Whiteheadian stages of pedagogy: romance, precision, or generalization. At any rate, it suffices to say that the main themes of the theory of prehensions lend themselves well to the discussion of education, and, in particular, to types of pedagogies teachers may employ, thus further affirming the thesis that the theory of prehension is inclusive of, and conducive to a philosophy of education.

#### **IX. Conclusion: Towards a Pedagogically-Oriented Reading of Whitehead’s Theory of Prehensions**

While the preceding analysis has sought to identify some problems with merging Whitehead’s writings on education and his overall cosmological scheme, it has demonstrated that there are many important and interesting connections one can make between the theory of prehensions and educational experience. Particularly, I have characterized some of the ways in which Whitehead’s theory of prehensions, which is a central part of his overall cosmological scheme, is inclusive of, and conducive to a philosophy of education. Stemming from this analysis, I will endeavour to provide a more comprehensive reading of Whitehead’s theory of prehensions as descriptive of a critical, process pedagogy, which is both positive and constructive, in a future work.

#### **Endnotes**

<sup>1</sup> Special thanks to Howard Woodhouse of the University of Saskatchewan for his deep scholarly contributions

to the writing, the content, and the preparation of this paper.

<sup>2</sup> Holmes continues, “although the latter book contains an important passage on the development of professional competence in education” (p. 626).

<sup>3</sup> According to Wegener,

“Existing conflicts between educational theories – formal versus informal, conservative versus progressive, classic versus subjective, liberal versus practical, realistic versus idealistic, academic versus pragmatic, logical versus psychological, external versus internal, and many others – are really complementary and reciprocal when viewed organically” (*Organic*, 29).

<sup>4</sup> In L. E. Hahn’s synopsis, Dunkel makes the case that

“there are ... at least three major difficulties for one who would relate Whitehead’s philosophy of education to his general philosophy; and these difficulties hinder effective use of his suggestions for education. In the first place, to our great regret, there is no book of his which expounds his general philosophy in its bearing on educational issues and problems.... In the second place, there is no single simple exposition of his cosmology and general philosophy which provides all the relevant background material for his ideas on education. *Process and Reality*, which has more for this purpose than any other single volume, is far from simple, and it needs to be supplemented by material drawn from his other writings .... The available summaries of his views, moreover, are pointed more toward metaphysics, theory of knowledge, or philosophy of science than toward education.... Perhaps the greatest difficulty for non-philosophy students, however, is Whitehead’s formidable technical vocabulary.” (*Dunkel*, ix)

<sup>5</sup> Evans further explains his position by stating

“I have linked myself with those interpreters of Whitehead who see in his whole work a lifelong interest in education and, in many of his formal works, insights about education. Joe Burnett and Harold Dunkel support such a view. Other commentators make connections across the range of Whitehead’s writings, but, to my knowledge, none attempt to construct a Whiteheadian philosophy of education. Such a construction requires a synthesis of formal and informal philosophy. This has been done throughout this book. The synthesis has been one created by an educator seeking to connect educational theory with process philosophy. The reverse, one by a philosopher seeking connections of Whitehead’s philosophy with education would be a different and valuable contribution to understanding Whitehead’s educational thought. Burnett argues that a scholar attempting this task would develop from Whitehead’s formal philosophy an explanation and elaboration of his educational philosophy” (35);

“(Joe Burnett) compares Whitehead’s educational writings and his formal philosophy, determining that a high degree of consistency between his formal philosophy and more informal philosophy exists. Burnett argues that this consistency allows, perhaps encourages, an exposition of Whitehead’s educational

philosophy based on concepts found in the formal philosophy. He sees Whitehead's educational writings as systematic and compatible with his formal philosophy. But, by comparison, the educational philosophy is not complete, for it lacks concepts found in the formal philosophy.... In another context, Burnett argues that any great impact of Whitehead's philosophy on educational theory will be as a result of interpretation of his general, formal philosophic writings" (40);

"It is apparent that Whitehead's educational writings lack the extensiveness that enables us to spin out a summation labeled 'Whitehead's Philosophy of Education.' His formal philosophy and educational writings must be conjoined so as to render, to the extent possible, a coherent presentation of Whitehead's philosophizing about education. It is also apparent that each commentator brings to the task of interpretation a particular perspective. In the absence of Whitehead's own explication of his philosophy of education, perhaps the best we can expect is a given writer's interpretation. The test of such an interpretation is that of scholarship and integrity, accurately reflecting Whitehead wherever possible and being clear about interpretation." (40);

"Whitehead's educational philosophy is anchored within his philosophy of organism.... In *Science and the Modern World* we meet (the) ideas (...) (i.e.) prehension, concrescence, connectedness, (etc...) (...), not as aspects of a theory of education, but as part of his attempt to explain the world." (49);

"Whitehead's metaphysics must be examined if a full accounting of his philosophy of education is to be attempted.... Education is not the whole of life and does not require a metaphysics that describes reality as a whole. What is required is an examination of the metaphysics that focuses on considerations of teaching, learning, and the conditions that affect these basic elements of education. To present Whitehead's metaphysics in relation to education necessitates going beyond his written work on education. That is not to dismiss his informal educational writings. Whitehead's informal educational writings and his formal philosophy are compatible" (97).

<sup>6</sup> In "Process, Teaching, and Learning," Evans suggests that

"If process philosophy of education is to move beyond mere academic interest there needs to be a clear, readily comprehensible explanation of what it is, a theory of education structured from that philosophy, and plans for an organized effort to disseminate philosophy and theory to skilled practitioners. (...) The leadership of an advance toward a coherent process philosophy of education will not be that of a single individual. (...) The first step toward constructing a coherent process philosophy of education is the exposition of what is meant by process philosophy of education. Whitehead intended to tell us but never did. Competent scholars, given adequate resources, could unpack Whitehead's work and that of Bergson and Dewey to give us a coherent process philosophy of education. (...) I am convinced that a highly relevant, coherent philosophy of education exists within the great corpus we have inherited from

Whitehead. I firmly believe that committed scholarship and supportive institutions could bring it to light and ultimately to fruition.” (5)

<sup>7</sup> For example, see Mellert’s recent online essay, “Searching for the Foundations of Whitehead’s Philosophy of Education.” Mellert argues that

“the third chapter of *The Aims of Education*, entitled, ‘The Rhythmic Claims of Freedom and Discipline,’ is where I find the essence of Whitehead’s educational philosophy. This philosophy, I shall argue, is simply a reiteration in educational language of the core principles of his general philosophy as stated in *Process and Reality* and in *Science and the Modern World*.” (2)

See Breuvert’s recent work, “How Could Be Related Ethics and Education in Whitehead’s Process Philosophy?” who states,

“Whitehead’s reflection about the educative process ought to be first found in his book *The Aims of Education*. But my point in this paper is to prove that one could find a more complete conception through a closer examination of *Process and Reality*’s Categorical Scheme. For we could find in it a conception of responsibility which is more relevant for a theory of educational process, and for a practice as well, in the sense of a more effective commitment in educative process” (286).

Also see Cobb’s paper, “Beyond Essays,” which takes up some of the work of H. Woodhouse, R. Regnier, and M. Flynn, who relate Whitehead’s more cosmological ideas to the philosophy and psychology of education.

<sup>8</sup> See *Process*, 54 and 338. In the first instance, Whitehead states that Locke’s and his contemporaries’ “identification of priority in logic with priority in practice has vitiated thought and procedure from the first discovery of mathematics and logic by the Greeks. For example, some of the worst defects in educational procedure have been due to it.” In the second instance, Whitehead writes that

“another contrast is equally essential for the understanding of ideals – the contrast between order as the condition for excellence, and order as stifling the freshness of living. This contrast is met with in the theory of education. The condition for excellence is a thorough training in technique. Sheer skill must pass out of the sphere of conscious exercise, and must have assumed the character of unconscious habit. The first, the second, and the third condition for high achievement is scholarship, in that enlarged sense including knowledge and acquired instinct controlling action.... The paradox which wrecks so many promising theories of education is that the training which produces skill is so very apt to stifle imaginative zest. Skill demands repetition, and imaginative zest is tinged with impulse. Up to a certain point each gain in skill opens new paths for the imagination. But in each individual formal training has its limit of usefulness. Beyond that limit there is degeneration: ‘The lilies of the field toil not, neither do they spin.’”

<sup>9</sup> One may consider Whitehead’s own definition of a ‘prehension’ in *Modes of Thought*, that “life implies the absolute, individual self-enjoyment arising out of this process of appropriation. I have, in my recent writings, used

the word prehension to express this process of appropriation.” (150-151) In originally defining what a prehension is in *Science and the Modern World*, Whitehead writes, “The word *perceive* is, in our common usage, shot through and through with the notion of cognitive apprehension. So is the word *apprehension*, even with the adjective *cognitive* omitted. I will use the word *prehension* for *uncognitive apprehension*: by this I mean *apprehension* which may or may not be cognitive.” (69)

<sup>10</sup> As explicated by R. Cloutier,

“Deux mécanismes se trouvent à la base de l’adaptation: l’*assimilation* et l’*accomodation*. L’assimilation correspond à la structure de l’organisme. Le sujet transforme alors les éléments pour les intégrer, les assimiler à ses structures. Pour ce qui est de l’accomodation, le sujet modifie ses structures (ses schèmes), il se transforme en fonction des pressions qu’exerce sur lui le milieu extérieur.” (*Psychologie*, 79)

<sup>11</sup> It is interesting to note that according to G. R. Vasquez, negation as taught in scientific-technological education is, to some extent, responsible for ecological devastation. He charges that it is responsible for “the separation of man from nature, ... the de-naturalization of man, and the de-sacralization of the world.” (*Vasquez*, 172) Particularly, he cites “Abstraction, (which) as we know, is not only to separate something mentally that in reality is united, it is a way of mentally tearing nature to pieces,” (*Vasquez*, 189) as a fundamental reason why modern education is responsible for such degradation.

<sup>12</sup> For Whitehead, consciousness is only involved in the subclass of ‘comparative feelings’ he calls ‘intellectual feelings’, that may be subdivided into ‘conscious perceptions’ and ‘intuitive judgments’.

<sup>13</sup> In contrast to a positive appropriation of relevant data into the constitution of a subject, as in a prehension of the positive kind, a negative prehension is the elimination of irrelevant data from entering into the constitution of a subject.

<sup>14</sup> According to M. Flynn, “Piaget fails to explain the relationship between bodily feelings, emotions, and higher forms of consciousness in human beings” (*Conflicting*, 365); for Piaget, “Emotions, in themselves, have no intrinsic value but act merely as an external force capable of driving the cognitive mechanisms of which the learning machine is composed” (*Conflicting*, 365); Piaget’s “portrayal of all conscious experience as the cognitive schematization of reality eliminates emotions and bodily feelings from the lives of human beings” (*Conflicting*, 368).

<sup>15</sup> See Fidyk, *Experience and Learning in the Educational Thought of Alfred North Whitehead*.

<sup>16</sup> See *Dunkel*, 109-112. According to Whitehead, the stages of mental growth are emphatically ‘Hegelian’. He states, “I think that Hegel was right when he analysed progress into three stages, which he called Thesis, Antithesis, and Synthesis; though for the purpose of the application of his idea to educational theory I do not think that the names he gave are very happily suggestive.” (*Aims*, 17) Scholars must always take Whitehead’s comments on Hegel with ‘a grain of salt.’ This is the case, first, since Hegel did not invent the terms: ‘Thesis, Antithesis, Synthesis’. Rather,

they are attributable to Fichte, Hegel's predecessor. Second, Whitehead's view of Hegel came through the Bradleyian tradition and his interactions with McTaggart and Haldane, as well as from critics of Hegel, such as the New Realists. Third, the notion of 'Absolute Idealism' was popularized by the British Idealists and the New Realists at the turn of the twentieth century without careful scholarly consideration of Hegel's actual works. Thus, for these reasons, we must treat Hegel as a philosopher generally on the peripheries of Whitehead's knowledge. However, while Whitehead's general comments on Hegel are, for the most part, inaccurate, his elaboration of the 'rhythms of education' as romance, precision, and generalization, as an extension of Hegel's logical Concept for the purposes of education, is surprisingly accurate. It closely follows Hegel's depiction of the 'moments' in the progression of the logical Concept. As Hegel writes, "with regard to its form, the logical (Concept) has three sides: ( $\alpha$ ) *the side of abstraction or of the understanding*, ( $\beta$ ) *the dialectical or negatively rational side*, (and) ( $\gamma$ ) *the speculative or positively rational one.*" (*Encyclopedia*, 125-134). Also, Whitehead's notion that progress in learning is consists in the return from the stage of 'generalization' to 'romance' is in step with the 'Hegelian' notion that a new 'synthesis' is itself a new 'thesis'.

<sup>17</sup> See Woodhouse's "Ultimately, Life is not for Sale," in which the rhythms of education are compared with a Whiteheadian description of life processes. Education is said to be intrinsically part of the "means of life." (223) Also on this note, see Whitehead's *The Function of Reason*, in which he argues that "the function of reason is the promotion of the art of life" (p. 4) in order "(i) to live, (ii) to live well, (iii) to live better." ( 8)

<sup>18</sup> Also see Woodhouse's "Ultimately Life is Not for Sale", 224, making reference to McMurtry's notion of education as "enabling the growth of the learner." I thank H. Woodhouse for his presentation of Whitehead's 'rhythms of education' and these meanings of education to me, which I have here appropriated and restated.

<sup>19</sup> A Heideggerian reflection is that McMurtry's definition of education (*educare*) as 'to *cause* to grow' is partially problematic in that 'causality' here implies some kind of instrumental motivation and control towards the aim of cognitive development, which is not what is desired with respect to education. I say this also in light of George Grant's critiques of technology in the educational system. Such an instrumental motivation would seem to reflect his statement that "within the last hundred years, it has become increasingly clear that the technological society requires not only the control of non-human nature, but equally the control of human nature. This is the chief cause of the development of the modern 'value-free' social sciences" (*Grant*, 118). Ideally, I would think that it is (or should be) the student who, to a large extent, motivates herself to learn. Rather than being passive receivers or consumers of knowledge, students should develop an active personal responsibility for their education and should refuse to let others do their thinking for them.

<sup>20</sup> Also, 'growth' is not meant in its 'market sense' of the increase in size of an economy, nor of economic development in general. Interpreting 'growth' in its organic meaning implies that there are limits to growth, where

there are seemingly none in economic theory.

<sup>21</sup> Whitehead defines that actual entities are the “final real things of which the world is made up.” (*Process*, 18)

<sup>22</sup> For Whitehead, the term, ‘objectification’ “refers to the particular mode in which the potentiality of one actual entity is realized in another actual entity” (*Process*, 23). While not appearing in *Process and Reality*, Wegener does use the term “subjectification” (*Organic*, 81). Particularly, in Whiteheadian terms, the appropriation of an object implies the subjectification or the ‘becoming-subject’ of the subject and vice-versa.

<sup>23</sup> These notions that the teacher and the learner ‘grow together’ as in Whitehead’s process of concrescence is implied by P. Freire in his critique of the ‘banking model of education’. Freire describes the ‘banking model of education’ as that which is “an act of depositing, in which the students are the depositories and the teacher is the depositor.” (*Pedagogy*, 72) On the contrary, for Freire, “Education must begin with the solution of the teacher-student contradiction, by reconciling the poles of the contradiction so that both are simultaneously teachers *and* students.” (*Pedagogy*, 72)

<sup>24</sup> McMurtry’s definition of critical inquiry may be said to represent precisely what Martin Heidegger takes issue with in “The Question Concerning Technology.” For Heidegger, it belongs to the essence of the truth sought by technological thinking, that, in the manner of ‘enframing’ (*Ge-stell*), it instrumentally ‘disclose’ or ‘reveal’ (*aletheia*) the nature of beings, thus doing violence to them in the process. Thus, while ‘educating for critical thought’ is to be affirmed, it is not to be overstated so as to do violence to the persons, animals, and other organisms that are the objects of investigation.

<sup>25</sup> For example, see ‘Intellectual Freedom: Discussion Paper and Proposed Policy’, September, 1989, *Saskatchewan Teachers Federation*, which is a policy document aiming at developing guidelines for the criteria and procedures of selecting learning materials.

<sup>26</sup> J. Derrida, in coining his notion of ‘deconstruction’, was influenced by Heidegger’s notion of ‘Destruktion’ (*Zerstören, Zerstörung*) which was used to loosen up the layers of the history of ontology, with a view to point to time and temporality as the meaning of Being. This notion of ‘Destruktion’ was fused together with ‘Abbau’, meaning to “take apart an edifice in order to see how it is constituted.” (*Derrida*, 87) With these two notions, Derrida coined the term ‘deconstruction’.

<sup>27</sup> Also see F. N. Walker’s paper entitled, “Whitehead on Soul Murder in Education”.

<sup>28</sup> See P. Freire, *Pedagogy of the Oppressed*, pp. 71-86.

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