THE EMERGENCE OF BIG HISTORY

An interdisciplinary case study on the extent to which Big History can contribute to the modernization of the Dutch educational system.

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Introduction

In November 2014, the Dutch State Secretary for Education, Culture and Science, Sander Dekker, launched a national debate regarding the modernization of the Dutch educational system. The current educational system is allegedly too fragmented, old-fashioned and not in touch with modern-day society. As a result, more than 16.000 people, including parents, teachers, educational experts and representatives of societal organizations, were invited to discuss their take on necessary future-oriented knowledge and skills.[1] The insights presented in *Platform Onderwijs2032* are the result of these contributions and aim primarily at preparing high school students for the society of the future.[2] *Platform Onderwijs2032* has been – and continues to be – heavily debated. Critics argue that its fundamentals are unscientific and cliché.[3] It will, however, be assumed that the Platform's insights are extensive enough to offer an idea into how the government interprets the modernization of the Dutch educational system.

The Platform puts great emphasis on the relevance of the digital world as well as cross-curricular, interdisciplinary working and thinking. This latter aspect makes the Platform's insights of particular interest to the present thesis and, more generally, to a widespread scholarly debate. Many have come to realize that complex issues are often beyond the scope of disciplinary knowledge, and that the integration of various disciplinary concepts, theories, and techniques relevant for a specific phenomenon offers a deeper, more fundamental understanding of complex issues.

Big History, for instance, an increasingly popular course, clearly departs from this confidence in interdisciplinary reasoning. It examines history in its totality – from the Big Bang to the present – by integrating a wide range of disciplinary knowledge into one big picture of human existence. This concept sparked a great interest in the potential advantages of Big History for the modernization of Dutch secondary schools. Hence, this thesis aims to inquire to what extent Big History can contribute to the modernization of the Dutch educational system.

The various components of this research question – e.g., Big History, modernization of education – are all interconnected and too complex to explain from a single discipline. In

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[1] "Wat is Onderwijs2032?" Onderwijs2032, accessed September 21, 2016, http://onsonderwijs2032.nl/over-ons/.

[2] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies* (Den Haag, 2016), 13, accessed September 20, 2016, http://onsonderwijs2032.nl/wp-content/uploads/2016/01/Ons-Onderwijs2032-Eindadvies-januari-2016.pdf.

[3] Johannes Visser, "Reconstructie: Onderwijs2032, een schoolvoorbeeld van schijninspraak," *De Correspondent*, May 2016, accessed November 2, 2016, https://decorrespondent.nl/4486/reconstructie-onderwijs2032-een-schoolvoorbeeld-van-schijninspraak/356426158-f6c2cb6c.

order to create a holistic answer, i.e. a more comprehensive understanding[4], to the complex issue at hand it becomes necessary to integrate different disciplinary insights.

It is, however, of great importance to answer this question with care. Rethinking and reshaping the Dutch educational system can have extreme implications for students and society. After all, as Jean-Jacques Rousseau, Swiss-born 18th century philosopher and writer once famously said, "plants are fashioned by cultivation, man by education."[5] Similarly, the development of students, i.e., 'the way they are shaped', in many respects depends on the way education is organized – or, in this particular case, modernized.

In order to do this, this thesis combines insights from history, philosophy of education and educational science respectively. Each field will address the research question in its own way. Even though many other disciplines, such as sociology and psychology, also share an interest in education, the researchers believe to have grouped the three most relevant disciplines to the issue at hand. History clarifies what Big History entails, i.e., its content. Philosophy offers insights on the modernization of the Dutch educational system and underlying educational philosophy. Educational science explores the educational course itself and its learning objectives independently of the course content. The three disciplines thus come together to illustrate to what extent Big History can contribute to this modernization.

The first chapter of the present thesis focuses on the historic perspective. The historian aims to contribute to the present thesis by inquiring into the essence of Big History: What is Big History? What are its origins? This inquiry clarifies that 'Big History', contrary to what the name suggests, differs from history. Its interdisciplinary character and research methods make it an intrinsically different subject. The historiographical debate presented next, offers the basic understanding of what Big History entails, as well as its historical positioning and possible implications. More importantly, the historian's analysis makes the distinction between history and Big History particularly clear, thus contributing to a more comprehensive understanding of the interdisciplinary question at hand.

The second chapter zooms in on the concept of 'modernization' within the discipline of educational philosophy. It is difficult to see the potential connection between Big History and the modernization of the Dutch educational system without a more concrete definition of modernization. The philosopher begins, therefore, by unraveling the Platform's perspective on

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[4] Allen F. Repko, *Interdisciplinary Research: Process and Theory,* 2d ed. (Los Angeles: SAGE, 2012), 63.
[5] "Jean-Jacques Rousseau on Emile's Education," New Learning: Transformational Designs for Pedagogy and Assessment, accessed November 9, 2016, http://newlearningonline.com/new-learning/chapter-2/jean-jacques-rousseau-on-emiles-education.

five fundamental characteristics. The Platform's underlying philosophy is then unraveled by comparing these fundamental characteristics to existing educational philosophies. Finding a specific educational philosophy makes the concept of modernization more tangible because it not only mentions *what* modernization should entail, but it also argues *why* it should be that way. Thus, if one understands the purpose of modernization, it becomes easier to understand whether courses such as Big History can help achieve its goals.

The third chapter takes a more practical approach to the concept of 'modernization' from the framework of educational science. Educational scientists examine how people learn and what can or should be done to facilitate learning processes. It is the goal of the educational scientist in the present thesis to examine the Dutch Big History course, initiated by philosophy teacher Constance van Hall, in detail to explore whether it encourages development of relevant modern skills. These skills are defined in terms of 21st century education and skills and compared to those skills relevant to interdisciplinarity. This offers a deeper understanding of Big History's contribution to modernization on a skill-level.

Next, the researchers begin their quest for a more comprehensive understanding of the research problem. They begin by mapping the problem in an organizational model and create common ground between disciplines by clustering corresponding insights in domains. They integrate conflicting insights by redefining and expanding relevant concepts to the model. The common ground and integration of insights offer a more comprehensive answer to the question: to what extent can Big History contribute to modernization of the Dutch educational system? Thereafter, the researchers take the time to self-reflect on the limitations of the present thesis. They conclude with a call for action: if this course is to be successful, resources have to be made available so that educators can exploit Big History's full potential.

Chapter 1: Big History, a Historical Interpretation

Ever since American historian David Christian's publication of *Maps of Time: An Introduction to Big History*, Big History has emerged to what is now considered by many a noteworthy discipline reaching a wide range of people. Big History is not only a research field in the academic world but also a course available in American and Australian universities and at secondary schools. And now the Dutch have shown interest in the Big History concept, with 42 Dutch high schools incorporating the Big History program in their curricula. Could it be that Christian was right in his belief that the long tradition of Universal History will be revitalized? This return to Universal History will, however, adopt a different shape, for "the new form of universal history will be global in its practice and scientific in its spirits and methods."[6] Big History describes the course of history from the Big Bang to modernity and tries to organize history on different scales, thereby consulting a wide variety of disciplines.

This latter aspect is key to Big History's interdisciplinary character, as it operates on the border between the humanities and the sciences. Due to this new kind of Universal History, Christian argues, the borders between the humanities and the sciences will fade away; a new Kuhnian paradigm could emerge, allowing for an interdisciplinary study on the human history.[7] For the 'regular' historian few aspects will change. Nonetheless, as said by Christian, the context of historical research will see changes, because human history becomes part of a bigger history: the history of the cosmos. [8]Also, the ways in which history can be applied are likely to change: Big History is goal-oriented. Its goal is to counteract the fragmented knowledge of students by creating an overview – and thereby encouraging awareness – of the complex relation between mankind and its biosphere. In his book *The Pursuit of History*, John Tosh offers certain general propositions about history and its uses.[9] Tosh's propositions regarding the utility and application of history are of particular interest to a better understanding of Big History and its position in the historiographical debate.

The present chapter will focus mainly on Christian's concept of Big History – since the format of the course, as applied in Dutch schools, is based on his work – so as to contribute to the interdisciplinary research on the modernization of the Dutch educational system and Big History's potential contributions. The first section explains the origins as well as the implications of Big History as a discipline. Next, an analysis of the historiographical

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[6] David Christian, "The Return of Universal History," *History and Theory* 49 (December 2010), 6.
[7] Ibid., 19.
[8] Ibid.
[9] John Tosh, *The Pursuit of History*, 5d ed. (Great Britian: Pearson, 2010), ix.

debate – regarding the various kinds of world history – and Big History's positioning herein will be given. This section aims to provide an answer to questions such as: what distinguishes Big History from World History, deep history, macrohistory and Universal History? What are the most eminent criticisms of Big History? And to what extent is the 'Creation Myth' driven by a clear ideology? Whether or not Big History is appropriately described as an historical study or rather as an interdisciplinary study uniting the humanities with the sciences, is the last concluding question to be addressed in this chapter.

Big History: A History

David Christian, one of the major advocates and founder of Big History, is an American historian specialized in the history of Russia. During one of his research projects on the drinking behavior of the Russian rural population, Christian faced various difficulties: his specialization was insufficient to conduct a worthy research and he argued instead that the history of mankind underpinned everything that followed.[10] As a result, he started asking himself bigger questions – "what is the whole of history?" and "where does human history begin?" – and reached the ultimate beginning: the Big Bang, about 13 billion years ago.[11] He answered his own questions in his teachings; from 1989 he taught 'HIST112: An introduction to World History' at Macquarie University in Sydney, Australia.[12] Shortly after, 'The Case for "Big History"' was published, and from that moment on other scholars started to participate in the discussion of Big History from an academic viewpoint. Among others Fred Spier in the Netherlands and Eric Chaisson in the United States became Big Historians; thus Big History was no longer an Australian but had become a global phenomenon.

Big History emerged during a period in which various scholars from different disciplines started collaborating. This trend was particularly visible within the natural sciences due to major developments achieved in the postwar years. The "historicization of the natural sciences"[13] sparked the interest in the history of mankind. Consequently, historians were handed new theories and research methods. The discovery of radiometric dating techniques in the 1950s, for instance, allowed the measurement of the Earth's age. This chronometric revolution enabled scientists to create a geologic timeline based on absolute scientific

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[10] Constance van Hall, *Big History: een vakoverschrijdende oriëntatie op de wetenschappen* (Amsterdam: Uitgeverij Boom, 2015), 10.
[11] Marnie Hughes-Warrington, "Big History*," *Social Evolution & History* 1 (March 2005), 8.
[12] Ibid.
[13] Christian, "The Return to Universal History," 19.

measurements rather than written sources.[14] Subsequently, empirical research on the prehistory, the history of planet earth and the history of the cosmos became possible. These circumstances caused Big History to flourish in the 1990s. The scholarship of Big History became more extensive and Big History courses became part of academic curricula. The International Big History Association was founded in 2010, inspiring interdisciplinary research and promoting education of the history of the cosmos, the earth, life on earth and humanity.[15] Around the same time David Christian prepared his successful TED Talk on Big History, reaching millions of people, including none other than Sir Bill Gates. In 2011, Gates provided funding for a free Big History course for secondary schools in Australia and the United States of America, later to be named the Big History Project, on which the Dutch Big History courses are based.

The Discipline

Big History looks at the history of mankind in its totality: from the history of the universe, to the history of the earth and, consequently, the history of man,[16] while also making predictions about our cosmic future. Big History, therefore, touches on a wide range of disciplinary fields such as cosmology, geology, biology, archaeology, palaeology, anthropology, psychology and history.[17] One of the most prominent characteristics of this course is its concern for the past, present and future, through which it explores "an endless waltz of complexity and chaos".[18]

By means of eight 'thresholds' the different phases of complexity in history are distinguished. With each threshold a new structure arises, increasing the complexity in the universe in time. For example, the fourth threshold describes the emergence of the solar system and planet earth. At a certain point in time the conditions in the universe were just right for this new structure to emerge. These Goldilocks conditions instigated increased complexity. In the same way, but at a later point in time, life emerged on planet earth, the start of a new threshold. As such, Big History created a new timescale as the thresholds embody ongoing processes. Big History also discusses processes such as entropy and collective learning, thus offering a new perspective on history.

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[14] Christian, "The Return to Universal History," 18.
[15] Allan Megill, "'Big History" Old and New: Presuppositions, Limits, Alternatives," *Journal of The Philosophy of History* 9 (2015), 307.
[16] Wolf Schäfer, "Big History, the Whole Story, and Nothing Less?" *Canadian Journal of History* (Autumn 2006), 317.
[17] Ibid., 317-318.
[18] Hughes-Warrington, "Big History*," 12.

One of the challenges of Big History is the pervasiveness of the field, as it is vaguely defined. In the historiographical debate, uncertainties of what exactly it is that Big History entails are apparent. Big Historians usually originate from different backgrounds and discuss a wide diversity of subjects. Spier, for instance, is a biochemist, cultural anthropologist and social historian, while Chaisson focuses on the natural scientific aspect of Big History. Marnie Hughes-Warrington explains that all Big Historians explore "patterns of balance and imbalance between order and disorder, but use different conceptual frames."[19] Big Historians are hard to identify as such and the position of Big History in the field of history is hard to determine. Within history, there are several sub disciplines addressing research on a larger scope, including global history, World History, macrohistory, deep history and a rich tradition of Universal History.[20] The specific timeframe that Big History scrutinizes is what differentiates this particular discipline from all the mentioned above. Deep history and World History solely explore human history. Deep history is referred to as "deep" as it exceeds the lines between prehistory and history.[21] World history focuses on the Anthropocene, the period of visible influence of humans on the earthly climate.[22] Therefore, Big History cannot be positioned within two these sub disciplines.

Christian states that Big History is different from the other sub disciplines because of the interdisciplinary nature of the field and the search for an underlying unity in the past. [23] In 2005, Hughes-Warrington published a paper on Big History stating that the discipline was still a work in progress.[24] While Christian defines Big History as a kind of microhistory, she argues "that 'macrohistory' is not big enough to encompass big history."[25]

Since 2010, Christian seems to have agreed with Hughes-Warrington's idea that Big History can be better understood in terms of Universal History. He argues, however, that Big History "is global in its practice and scientific in its spirits and methods", and cannot, therefore, return to the traditional Universal History of the past but should rather be understood as a new kind of Universal History.[26] New Universal History is

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[19] Hughes-Warrington, "Big History*," 12.
[20] Christian, "The Return to Universal History," 15.
[21] David Armitage, ''What's the Big Idea? Intellectual History and the Longue Durée,'' *History of European Ideas* 4 (2012), 494.
[22] Ibid.
[23] David Christian, *Maps of Time: An introduction to Big History* (Berkeley: University of California Press, 2011), xxiv.
[24] Hughes-Warrington, "Big History*," 9.
[25] Ibid., 14.
[26] Christian, "The Return to Universal History," 6.

> "the attempt to understand the past at all possible scales, up to those of cosmology, and to do so in ways that do justice both to the contingency and specificity of the past and also to the large patterns that help make sense of the details."[27]

This description of Universal History is similar to the definition of Big History. Nevertheless, positioning Big History within Universal History is highly criticized, as Universal History is not very popular among historians, as will be shown below.[28]

The Grand Narrative and the Creation Myth

By the end of the 19th century the long tradition of Universal History had ended. The tradition, which according to Raoul Martley started after the conquests of Alexander the Great, was undermined by modern history.[29] Modern history was based on specialized research in line with the standards of historicism. As a result, the scale of the historians' research area was rigorously reduced. Universal History and other forms of world history were portrayed as overoptimistic, old-fashioned and metahistoric.[30] Universal History never disappeared completely, but was eclipsed by numerous new specializations in the field. Many historians today do not consider Universal History to be a proper academic sub discipline of history; the rise of postmodernism furthers the degradation of the sub discipline of Big History.

Classifying Big History as a new Universal History, and the comparing it to the grand narrative, does not sit well either with various experts. According to post-modern theorist Jean-François Lyotard, "the grand narrative has lost its credibility".[31] Paul Turnbull, scholar and teacher of Big History, explains that Christian's positioning is inconvenient. In addition, Spier, another Big History advocate, claims that even Alexander von Humboldt's work could be applied as a foundation text of Big History.[32] Hence, Big History is sometimes compared to the positivism of the 19th century, doing injustice to the relevance and historical value of the discipline.

Big History is subject to criticism, not only for its positioning, but also for its structure. Christian assumes that Big History searches for deep, even law-like patterns of change in history, to create a kind of creation myth that constructs a map connecting all individuals and communities as a part of the same evolving story.[33] The aim in this new

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[27] Christian, "The Return to Universal History," 7.
[28] Paul Turnbull, "The Aims of Big History," *History Compass* 7 (2015), 352.
[29] Christian, "The Return to Universal History," 12.
[30] Ibid.
[31] Ibid., 8.
[32] Turnbull, "The Aims of Big History," 352.
[33] Christian, "The Return to Universal History," 7.

Universal History is to approach humanity as a whole, to create a feeling of connectedness and global citizenship. The Creation Myth for our modern world 'characteristically serves to support, for good or ill, one or another people, religion, political project, set of policies, or meta-historical fantasy', according to Allan Megill, historian of the theory of history and intellectual history. [34] In contrast to world historian David Northrup and global historian Wolf Schäfer, Megill vocalizes that it is odd to try to incorporate a myth into the world of history. He claims that myths have a distinct and different function in the world, and that there is not a place for such stories in the academic world of history.[35]

Hughes-Warrington states that postmodernists also criticize Big History and its Creation Myth. Foucault, Derrida and Lyotard have emphasized that a coherent story, such as Big History, changes history into a mythology strengthening the power of the white, male elite.[36] They make an interesting statement as Big Historians argue that Big History "veers away from the high cultural focus and total anthropocentrism of earlier Universal Histories."[37] It is assumed that other Universal Histories tend to put off the period before the emergence of humans "as a prologue to human history", while Big History aims at relocating humans in relation to the biosphere and universe.[38] In his review of Christian's *Maps of Time* (2004 edition), global history specialist, Schäfer, writes that in practice it is doubtful whether Big History truly refutes the anthropocentrism of earlier Universal Histories. He calculated that in *Maps of Time* only 27% of the pages was dedicated to the prologue to human history while this phase in time in fact covers 99% of history.[39]

The Discipline, the Goal and the Effect

Most critics look at the way upon History is constructed. This may be due to the fact that the structure of Big History differs from the regular framework of historians. The goal of Big History in particular, i.e., "the map of reality" which "covers our entire existence and the origins of the cosmos, the earth, life and humanity", makes it essentially different.[40] This map functions as a navigational instrument of new Universal History, making Big History a goal-oriented discipline. Furthermore, this map creates a picture of humanity as a whole,

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[34] Megill, "'Big History" Old and New: Presuppositions, Limits, Alternatives," 324.
[35] Ibid.
[36] Hughes-Warrington, "Big History*," 10.
[37] Ibid., 16.
[38] Ibid., 17.
[39] Schäfer, "Big History, the Whole Story, and Nothing Less?" 318.
[40] Hughes-Warrington, "Big History*," 9.

encouraging global citizenship which is then spread through education.[41] According to Christian, this is precisely one of the many desirable consequences of Big History, namely: creating awareness for the complex relation between man and the biosphere, while also encouraging awareness regarding the consequences of human behavior to the environment.[42]

World historian, David Northrup, compares Big History to the medieval chronicles of Universal History. This discipline often explored larger structures in which mankind forms the focal point. Similarly, Northrup argues, Big History does the same but puts greater emphasis on an environmentalist approach, thereby seeking to "remind us of our humble origins and our debt to the rest of nature."[43] The pursuit for this kind of ideology is contrary to one of the basic principles of history. After all, historians must offer an historical perspective that can contribute to the academic debate, "rather than to serve any particular ideology."[44] According to Tosh, this latter aspect is a danger to many new historian specializations and should be avoided.[45] Big History's metahistorical suggestion also incites criticism. "Only a visionary would accept the full implications of metahistory; only an antiquarian would be content to surrender all claim to practical utility. The most convincing claims of history to offer relevant insights lie somewhere between these two extremes."[46] Tosh argues that there ought to be a balance between the practical utility of history and meta-history so as to create relevant insights. In a way, Big History realizes both these aspects, as it is often considered metahistorical because it is a Creation Myth. Nonetheless, this Creation Myth is founded on scientific knowledge; Big History is less metahistorical than it may initially seem. The practical utility of Big History is widely measured by Christian and, admittedly, sometimes shows ideological features. An ideology does not, however, need to be detrimental. Christian argues that, in a world with nuclear weapons and ecological damage, it would be more detrimental to focus on "the divisions between nations, religions and cultures".[47] And that may well be true. After all, Tosh stresses that practical purposes can be pursued without damaging the standards of historian scholarship exactly because historians "zealously scrutinize" the work done by others so as to avoid bias.[48]

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[41] Christian, "The Return to Universal History," 8.
[42] Ibid., 25.
[43] David Northrup, "When Does World History Begin (And Why Should We Care?)," *History Compass* 1 (2003), 1.
[44] Tosh, *The Pursuit of History*, 49.
[45] Ibid.
[46] Ibid., 32.
[47] David Christian, *Maps of Time: An introduction to Big History* (Berkeley: University of California Press, 2004), 8.
[48] Tosh, *The Pursuit of History,* 48.

The above shows that the concept of Big History is difficult to grasp. The present section aims to answer the following question: is Big History relevant as an historical study or as something else, an interdisciplinary study that unites the humanities with the sciences? Christian refers to Big History as a project. In his introduction of *Maps of time: An Introduction to Big History it* seems that Big History's goal is to contribute to a larger project: the construction of "a more unified vision of history and of knowledge in general."[49] Nonetheless, the discipline seems to have grown so much that it can perhaps best be referred to as a sub discipline. Repko's definition, for instance, describes a sub discipline as "a subdivision of traditional discipline; the formation of sub disciplines is a logical outcome of a cognitive division of labor and is a process driven by research."[50] Despite the many doubts of historians, Big History can, however, function as a source of relevant historical knowledge because its rationale of historical enquiry is compliant – even if on a bigger scale and with a different structure. Hence, Christian acknowledges the difficulties regarding this project, but argues nonetheless that it is possible and worth the endeavor.[51]

Conclusion

Big History describes history from the Big Bang to the present and, to that purpose, boarders on various disciplines. The insights and theories are integrated through thresholds of complexity to create one coherent story. Therefore, Big History could be considered an interdisciplinary discipline that unites the humanities and the sciences. The discipline is rooted in the historicization of the natural sciences, when Big History profited from the new insights and methods in the natural sciences. An increasing variety of scholars became involved in the new discipline. Christian transformed his teachings of the history of the universe into a serious interdisciplinary research field, with an educational element. In his publication *The Return of Universal History*, Christian positioned Big History in the tradition of Universal History. Analysis of the historiographical debate of the various sub disciplines in world history showed this positioning to be rather problematic. World historians and global historians argue that Big History would be conforming to 19th century positivism, undermining the relevance of the discipline. However, Christian argues that Big History is

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49 Christian, *Maps of Time: An introduction to Big History* (2004), 5.
50 Repko, *Interdisciplinary Research: Process and Theory,* 94.
51 Christian, *Maps of Time: An introduction to Big History* (2004), 5.

most definitely a new Universal History as it "will be global in its practice and scientific in its spirit and methods".[52]

The content of Big History is also subject to criticism. As a 'grand narrative' Big History could be interpreted as metahistorical, the goal of Big History is supposedly to create a Creation Myth, which is historically unacceptable. Furthermore, it supposedly had a strong ideological component. Although the criticism would, to some extent, appear justified, many arguments are based on misconceptions. The Creation Myth of Big History is a modern Creation Myth, based a modern scientific evidence, so that the Myth has a solid foundation. Big History is a sub discipline that gathers relevant historical information to create a scientific human history. In short, Big History could be considered a return to the Universal History that takes developments and progress in time and science into consideration. The scale, structure and goals of Big History show that the discipline is different to other similar sub disciplines in world history and offers opportunities for the future. Hence, since Big History is flourishing and yielding new insights, with the aim of creating an understanding of history as a coherent story, it hopes to contribute to the awareness of the complex relation between humans, the biosphere and the cosmos.

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[52] Christian, "The Return to Universal History," 6.

Chapter 2: The Educational Philosophy of Modernization

The extraordinary advancement from analog to digital technology, known as the Digital Revolution, has brought about sweeping changes ever since the latter half of the 20th century.[53] Admittedly, many of those changes remain yet unknown, but it is safe to assume that the impact of the digital revolution – often referred to as "Third Industrial Revolution" – on the structure, beliefs and development of world-wide societies will continue to grow exponentially.[54] Many believe, however, that the Dutch educational system is not prepared to accommodate the deep societal changes brought about by these technological advancements. It is this concern that generated the insights discussed in *Platform Onderwijs2032* regarding the kind of knowledge and skills high school students need in order to be prepared for an inherently different future.

According to Paul Schnabel, chairman of *Platform Onderwijs2032*, it is clear that the Dutch educational system is in dire need of a reorientation in order to prepare students for the drastic societal changes of the near future.[55] Accordingly, factual knowledge has become dispensable in a world where information can be recovered in a matter of seconds through trivial technological devices, such as smartphones. Instead, secondary schools should focus on the continuity, connection and relations between phenomena, i.e. interdisciplinary knowledge and skills that transcend the particular subject-matter upon which they are applied.[56] Although Dutch State Secretary for Education, Culture and Science, Sander Dekker, finds Schnabel's suggestion to be reasonable[57], many find it to be reason for concern. Historians, for example, fear that their discipline cannot be aligned with the goals the Platform has in mind. After all, how would one define the role of history in a context where knowledge of facts is perceived as dispensable?

The present chapter aims to contribute to the main question of this interdisciplinary research by inquiring into the Platform's underlying educational philosophy and its potential connection to Big History. The relevance of this inquiry is based on the idea that "understanding educational philosophy distinguishes professional educators from paraprofessionals and beginning teachers. True professionals not only know what to do, but

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[53] Ger Hostee and Denis Doeland, "Inleiding: van Analoog naar Digitaal," in *VanAnaloogNaarDigitaal.nu – De Digitale Verandering* (2014), accessed September 28, 2016, http://www.vananaloognaardigitaal.nu/inleiding-van-analoog-naar-digitaal-2/.

[54] Ibid.

[55] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies.*

[56] Ibid., 40.

[57] Janita Naaijer, "Rondvraag: hoe houdbaar is het advies Ons Onderwijs 2032?" *Volkskrant*, April 12, 2016, accessed October 13, 2016, http://www.volkskrant.nl/opinie/rondvraag-hoe-houdbaar-is-het-advies-ons-onderwijs-2032~a4280185/.

why they do it."[58] In the same vein, if the Platform's suggestion is to be put into practice, it is important that every individual involved in education understands its purpose as well as its relation to disciplines and modules. Subsequently, by revealing the Platform's educational philosophy it becomes easier to understand whether Big History can, indeed, contribute to this end.

In order to do so, this paper will be split into three subsections. For starters, a brief analysis of the Platform's recommendations on the modernization of Dutch high schools will be given. Next, we shall evaluate which educational philosophy underlies the Platform's perspective on modernization. Finally, an assessment will follow on whether – and to what degree – this perspective on modernization can be combined with the purpose of Big History. If the answer is positive, i.e., if Big History serves the same purpose as the modernization of the Dutch educational system, we might be able to reassure historians of the relevance of his subject-matter – that is, in so far as they are prepared to endorse Big History as an appropriate way of doing history.

The Platform's Educational Philosophy

Any educational philosophy builds on certain fundamental features: beliefs regarding the goal of education, the emphasis on curricula, the role of students and teachers respectively and the teaching methods applied. These five features were designed by philosopher Zinn in 1983 to help educators "begin a progress of philosophical inquiry and reflections on beliefs and actions"[59] related to education, and offer therefore a good basis for the present purposes. The most distinctive feature is the goal attributed to education. The remaining features, while relevant, serve merely as means to an end; i.e., the full realization of the respective educational goal.

The Platform departs from the general assumption that schooling ought to provide the necessary conditions for students to a) acquire knowledge, b) work on their personal development and c) become a prolific member of society.[60] Indeed, the desirable features of future-oriented education suggested by the Platform, such as "the development of knowledge and skills", "the employment of the opportunities offered by the digital world" as well as

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[58] Laura L. Bierema, "Philosophy of Organizational Learning," in *Philosophy and Practice of Organizational Learning, Performance and Change*, ed. Jerry W. Gilley, Peter Dean, Laura L. Bierema (Cambridge: Perseus Publishing, 2013), 14.

[59] Erin M. Zoellick, "Philosophical Orientation to Adult Learning: A Descriptive Study of Minnesota Environmental Education Practitioners," (master's thesis, University of Minnesota Duluth, 2009), 4, accessed November 17, 2016, https://d-commons.d.umn.edu/bitstream/10792/131/1/Zoellick,%20Erin.pdf.

[60] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies*, 25.

"learning how to cope with one's freedom and responsibility", not only aid personal and knowledge development but also allow students "to participate in the life of their community as full-fledged, autonomous citizens."[61] Nonetheless, the Platform seems to favor one over the rest. "To shape one's individual personality", for instance, serves only personal development, while the other educational goals appear neglected. The same could be said with respect to "meaningful, custom-made education". Hence, while future-oriented education aims to serve multiple purposes, it becomes clear that the Platform favors one: personal development.

It is easy to see that the educational philosophy defended by the Platform is student-centered. The Platform stresses the necessity of personal development and pleads for applicable schooling, i.e., up-to-date, flexible and relevant education, in order to trigger the student to participate out of his own curiosity and interest while teaching him responsibility, flexibility and entrepreneurship.[62] This perspective on the role of students is exactly the kind of "student-centered learning" meant to address "the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students"[63] and departs from the assumption that educational decisions ought to take students, and their needs, into account so as to facilitate the individual's learning process.

This perspective on the role of students has obvious implications for the curriculum. The Platform's suggestion is to limit the curriculum to a nucleus program which focusses mainly on the development of general knowledge and (inter)disciplinary skills rather than 'factual knowledge'.[64] By limiting the curriculum to a nucleus, schools can, in addition, accommodate various themes in-depth, thus encouraging individual interests while also including indispensable subject-matter. In other words, the nucleus ought to prepare students to become well-educated, informed and participatory citizens by making room for each student to in-depth pursue their own individual interests. This does not, however, mean that curriculum-deepening is in any way optional. It is mandatory for students to choose an in-depth field. Hence, students are free *in* – but not *of* – their choice.

The reorganization of curricula brings difficulties that schools have to cope with. According to the Platform, it is up to schools to make choices regarding the content of

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[61] D. C. Phillips and Harvey Siegel, "Philosophy of Education," in *The Stanford Encyclopedia of Philosophy* (Winter 2015 Edition), edited by Edward N. Zalta, accessed September 21, 2016, http://plato.stanford.edu/archives/win2015/entries/education-philosophy/.

[62] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies.*

[63] S. Abbott, "Student-Centered Learning," in *The Glossary of Education Reform*, last modified July 5, 2014, accessed November 4, 2016, http://edglossary.org/student-centered-learning/ .

[64] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies*, 52-54.

curricula, while taking student interests, necessities and capacities at heart.[65] Since schools do not make choices on their own, the task falls upon teachers "to arrange the content of their educational program in such a way as to contribute to the student's personal development, as well as his ambitions and talents, while deepening and expanding the student's knowledge and skills"[66]. Hence, the teacher's role shifts as he becomes more flexible in his subject-matter and more important in rethinking and reshaping a desirable interpretation of future-oriented education.

The Platform does not mention any specific desirable teaching methods but it does highly stress the necessity for interdisciplinary skills and joining questions. The complexity of problems known to our present and future society is too immense to remain confined within separate disciplines. Consequently, students ought to learn to cooperate and surpass disciplinary barriers by working on joining queries.[67] Hence, "meaningful, custom-made" education demands a wide variety of teaching methods that teachers are allowed to employ as long as it aids the development of interdisciplinary skills.

A Progressivist Perspective

Philosophy of education is a vast and complex sub-field of philosophy, one which "quickly runs into a difficulty not found to anything like the same degree in other disciplines".[68] In other words, there is lack of consensus. The overwhelming variety of conceptual frameworks makes it nearly impossible to master the "work done by such a range of figures, representing as they do a number of quite different frameworks or approaches".[69] Nonetheless, and as argued above, it is possible to discern the Platform's underlying educational philosophy from a set of fundamental features.

As John Dewey, a major advocate of progressive education, famously argued, educational philosophies tend to take the form of a contrast between traditional and contemporary education. Traditional educational philosophies depart from the assumption that schooling is "essentially static. It is taught as a finished product, with little regard to either the ways in which it was originally built up or to changes that will surely occur in the future."[70] Hence, traditional philosophies believe the future will be much like the past and argue

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[65] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies*, 44.
[66] Ibid., 25.
[67] Ibid., 40.
[68] Phillips and Siegel, "Philosophy of Education," in *The Stanford Encyclopedia of Philosophy*.
[69] Ibid.
[70] John Dewey, *Experience and Education* (New York: Simon & Schuster, 1997), 19.

therefore that it is the chief business of schools to transmit "the bodies of information and of skills that have been worked out"[71] to new generations. Contemporary educational philosophies, on the other hand, stress the need to shape the future. They depart from the assumption that change is the rule in societies, not the exception.[72] This evidently puts the Platform's pledge for a future-oriented education within the scope of contemporary educational philosophies: change is key and students should be prepared accordingly. Nonetheless, we need to dig deeper if we are to truly unravel the *specific* educational philosophy at play.

For starters, the goal of education, as argued by the Platform, is in many ways similar to the goal of Progressivism: equipping "individuals with the skills and substantive knowledge that allows […] them to participate in the life of their community as full-fledged, autonomous citizens."[73] It could be argued, however, that the Platform's foremost important goal of education is missing in this description, for while the Platform does indeed strive for the development of knowledge and citizenship, it particularly stresses the importance of individual, personal development. This argument is partially valid. The term "progressivism" encompasses numerous specific educational theories, many of which do not favor personal development. Nonetheless, "the progressive idea that each student is an active learner who is pursuing his or her own individual educational path"[74] is well alive and remains to many progressivists of particular interest.

Dewey, for instance, was particularly concerned about individual development. He believed in an intimate and necessary relation between education and *personal* experience and consequently felt that basing education upon personal experience facilitates individual learning.[75] Furthermore, he viciously opposed "the spectator theory of knowledge" and argued that students ought to be actively involved in their subject-matter, thus implicitly placing the student at the center of education.[76] Dewey's perspective on the role of students is not only very comparable to the Platform's student-centered education, but also assures the opposition that Progressivism does indeed place great importance on individual development, for it is through the distinct learning experiences of each individual student that they are enabled to become "enlightened and intelligent" citizens of society. Hence, much like *Platform*

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[71] John Dewey, *Experience and Education* (New York: Simon & Schuster, 1997), 17.
[72] Ibid., 19.
[73] Phillips and Siegel, "Philosophy of Education," in *The Stanford Encyclopedia of Philosophy*.
[74] Ibid.
[75] John Dewey, *Experience and Education* (1997), 25.
[76] Phillips and Siegel, "Philosophy of Education," in *The Stanford Encyclopedia of Philosophy*.

Onderwijs2032, Dewey believes that "the purpose of education is to enhance individual effectiveness in society and give learners' practical knowledge and problem-solving skills."[77]

Dewey argues that the failure to take the needs and capacities of individuals into account was the source of the idea that certain subjects are intrinsically necessary for the development of mental discipline.[78] It is this neglect that led to the traditional, static organization of subject-matter; one which leaves little room for – perhaps, the most important feature in educationally worthwhile experiences[79] – personal likes and dislikes. Dewey's perspective on subject-matter and its flaws, while not explicitly stated, accords with the kind of nucleus program suggested by the Platform for it accommodates the belief that each student should be able to in-depth pursue her individual interests. Also, he argues that segregated subject-matter "is so disconnected from the rest of experience that it is not available under the actual conditions of life."[80] Learning of this kind becomes inapplicable and of complete insignificance to the genuine preparation of students. This progressivist idea subtly leads to the Platform's suggestion that curricula should instead provide the kind of interdisciplinary skills necessary to transcend isolated disciplines, thus allowing for a more genuine knowledge to be put into practice under the actual conditions of life.

Much like the Platform, however, Dewey does not specify the particular content of curricula. He stresses instead the role of teachers in it. He argues that they bear a certain maturity regarding their own experiences and can, therefore, evaluate whether the experiences of their students are detrimental or conducive to continued growth. Consequently, the teacher must survey the capacities and needs of the particular set of individuals with whom he is dealing and must at the same time arrange the conditions which provide the subject-matter or content for experiences that satisfy these needs and develop these capacities.[81] Hence, teachers bear the task of guiding and "helping the student to make contact with [his] repertoire—but helping by facilitating rather than by imposing".[82] The teacher's task to understand the needs and capacities of students allows him to become more flexible in regard to his subject-matter while at the same time bearing more responsibility for the knowledge students acquire. As a result, and similar to the Platform's conclusion, the teacher's role shifts from a systematical, imposed one to a much more flexible yet responsible role.

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[77] Laura L. Bierema, "Philosophy of Organizational Learning," in *Philosophy and Practice of Organizational Learning, Performance and Change*, 17.
[78] John Dewey, *Experience and Education* (1997), 46.
[79] Ibid., 48.
[80] Ibid.
[81] Ibid., 58.
[82] Phillips and Siegel, "Philosophy of Education," in *The Stanford Encyclopedia of Philosophy*.

For Dewey, "experiences may be so disconnected from one another that, while each is agreeable or even exciting in itself, they are not linked cumulatively to one another."[83] Dewey's key idea is that not every experience is equally educative.[84] He believes that experiences arise from two principles: continuity and interaction. The first describes the way through which experiences relate to the individual's past and future experiences. The latter refers to the relation between an individual's experience and his environment; i.e., whatever conditions interact with his personal capacities, wishes, goals and needs. They are, therefore, not to be understood as separate from each other but rather as longitudinal and lateral aspects of "the educative significance and value of an experience."[85] Experiences that do not take the continuity and integration of knowledge into account are fragmented and thus "mis-educative". The interdisciplinary skills and joining questions recommended by the Platform can help realize this unity of experience. Joining questions, for instance, allow students to apply assembled knowledge from separate disciplinary fields on more general queries, thus contributing to the interaction between various academic fields. Interdisciplinarity, on the other hand, offers continuity of subject-matter. The teaching methods applied, therefore, have a significant impact on the quality of the student's experience, for "only when successive experiences are integrated with one another"[86] can students *genuinely* learn.

Big History as a Means to an End

It is clear that Dewey's progressivist philosophy accommodates the Platform's perspective on the reorganization of the Dutch educational system. Their views on the five fundamental features of educational philosophies are either similar or complementary. If the same holds true for Big History, i.e., if Big History fulfills, complements or aims at the features mentioned, it becomes clear that this course can contribute to the Platform's educational philosophy. It is the aim of the present section to briefly evaluate whether Big History can indeed fulfill these ends.

Big History's goal is to challenge "students to think critically and broadly"[87] as well as "to ignite a passion for inquiry and exploration."[88] Perhaps the most salient difference between the Platform's aim and that of Big History is that the latter, while it brings about the

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[83] John Dewey, *Experience and Education* (1997), 26.
[84] Ibid., 25.
[85] Ibid., 44.
[86] Ibid.
[87] "Big History Project FAQ 2014-15," Big History Project, 2, Accessed November 11, 2016, https://www.bighistoryproject.com/media/bhp-assets/BHP-FAQ-2014.pdf.
[88] Ibid.

citizenship and general knowledge desired, does not emphasize the need for personal development. For some, this may be enough reason to disregard Big History altogether. I believe, however, that Big History does not need to accommodate each and every feature of the Platform's philosophy to its entirety, for Big History is not the end in itself but only the means to achieve the Platform's educational philosophy.

Hence, the fact that Big History is not student-centered, should also not be problematic for it can, nonetheless, contribute to this end. The adjustable character of Big History allows for distinct learning needs and interests of individual students. Case studies show, in addiction, that "students reported feeling more respected, engaged, and empowered to do the work needed in BHP" and are, therefore, triggered to actively participate in class. Thus, while Big History does not place the student at the center of education, it does aid the features desired by student-centered approaches.

Big History's emphasis on general, rather than factual, knowledge is clearly in line with the Platform's outlook on curricula. Furthermore, the particular content in question is flexible so as "to meet key learning goals in your school"[89] as well as adjustable to the student's capacities, thus allowing teachers to apply the subject-matter as they see fit. Big History also highly encourages the teacher to assume "the stance as 'lead learner' rather than an all-knowing authority"[90]. The idea that teachers should be co-learners rather than dispensers of knowledge is similar to the progressivist idea that "the teacher loses the position of external boss or dictator but takes on that of leader of group activities."[91]

Lastly, the course focusses on three essential skills, namely "thinking across scale, integrating multiple disciplines, and making and testing claims."[92] The integration of multiple disciplines makes it safe to assume that Big History can offer the interdisciplinary teaching methods as desired by the Platform's progressivist philosophy. This aspect will, however, be subjected to a more detailed analysis in the following chapter.

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[89] "What is Big History Project?" Big History Project, accessed November 2, 2016, https://school.bighistoryproject.com/bhplive.
[90] "Summary of Big History Project Research – 2014/15 School Year," Big History Project, 19, accessed November 11, 2016, https://www.bighistoryproject.com/media/bhp-assets/Summary-of-BHP-Research.pdf
[91] John Dewey, *Experience and Education* (1997), 59.
[92] "Big History Project FAQ 2014-15," Big History Project, 2.

Conclusion

This chapter aimed to contribute to the interdisciplinary inquiry on whether Big History can contribute to the modernization of the Dutch educational system by means of analyzing whether the Platform's implicit philosophy of education can be unified with Big History.

It began by discussing the Platform's outlook on five fundamental features of educational philosophies. Accordingly, education ought to encourage citizenship and knowledge development but zooms in particularly on personal development. This student-centered approach requires interdisciplinary and in-depth curricula that suits the student's interests and capacities. It is the teacher's role to interpret what this may entail and, as a result, he becomes more flexible and more important with respect to future-oriented education. Secondly, it argued that the Platform's educational philosophy mostly resembles Dewey's Progressivism. Dewey's emphasis on the individual places the student at the center of education. He thus argues that students should be encouraged to pursue in-depth their individual interests and that it is the teachers' role to guide them in the process by means of continuity and integration of experiences. Finally, it reasoned that Big History can, indeed, be employed in such a way as to serve as means to the Platform's end, i.e. the realization of the Platform's progressivist educational philosophy. Of obvious importance here, is the assumption that Big History does not need to accommodate each and every feature in its entirety to be considered relevant. Those that do not accept this assumption may reach different conclusions.

Chapter 3: Exploring the Encouragement and Development of Interdisciplinary 21st Century Skills in Big History

Secondary schools traditionally teach their students what is important for them to know and be able to do as they grow up to be working adults. However, our society tends to change and these changes are coming even more rapidly nowadays. In the educational system students are prepared to go out into the world, function properly and make their contribution to society. Yet, it is argued that the current Dutch educational system does not prepare its students for the society of the future.[93] To this end, future-oriented education is set to get Dutch schools ahead of the rapid changes in society and prepare students accordingly. In order to realize this goal, students should be taught skills that last a lifetime and are useful at any time and in any situation.[94]

Future-oriented education is key to the Dutch government's plans to modernize the country's educational system.[95] An important aspect of future-oriented education is that a student should learn more of what could make them a valuable employee, rather than what a simple Google-search could tell them.[96] To function and contribute to a society where computers and robots are part of the workforce, a student should learn skills these computers and robots cannot do. Such skills are very important, perhaps even more so than knowledge. Therefore, this disciplinary study in Educational Science will focus on the development and encouragement of skills relevant to future-oriented education in Big History. To specify these skills, both future-oriented education and Big History will be discussed in further detail.

The final advice of *Platform Onderwijs2032* is partly based on the following statement: "One of the questions education systems will need to debate in order to prepare students for the future, is whether they should consider the removal of obsolete topics to make room for new, relevant and interdisciplinary areas of knowledge combined with increased focus on teaching higher-order thinking, social and emotional skills and metacognition."[97] Big History answers to one of those two criteria for it could be considered an interdisciplinary

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[93] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies*, 11.
[94] Ibid., 13-15.
[95] Ibid., 11.
[96] Michela Horvathova, "Evidence About Knowledge and Skills for Work and Learning," in *Review Study of OECD Dutch Curriculum: Onderwijs 2032* (2015), 1, accessed October 12, 2016, http://onsonderwijs2032.nl/wp-content/uploads/2015/09/OECD-Paper-1-EVIDENCE-ABOUT-KNOWLEDGE-AND-SKILLS-FOR-WORK-AND-LEARNING.pdf.
[97] Ibid., 26.

area of knowledge[98]. But, does Big History teach higher-order thinking, social and emotional skills and metacognition as well?

Big History is a new course that is currently taught in 42 Dutch secondary schools, usually in the fourth year (ages 15 and 16). It is not an official part of the curriculum. In some schools it replaces General Science ("Algemene Natuurwetenschappen") as it serves the same learning objectives, while in others it is an extracurricular option.[99] Big History starts at the very beginning, with the Big Bang Theory, and teaches students about the science behind the ever-increasing complexity of the universe and planet earth to this day. It covers topics from various disciplines like the creation of elements, gravity, molecular composition, life, plate tectonics, evolution, collective learning in humans and psychology. Big History also focuses on the scientists behind the theories regarding the world as we know it, and how these theories were constructed and proven to be true.[100] In the process, students are encouraged to explore their own interests in science, conduct experiments and write (scientific) papers.

General literature on Big History states that the concept fits well into 21st century education[101], which is closely connected to future-oriented education[102]. Twenty-first century skills are central to 21st century education.[103] These skills entail some of the higher-order thinking and social and emotional skills mentioned earlier. It is, however, unclear which specific skills are being taught in Big History. Considering Big History is an interdisciplinary area of knowledge, one might assert that those skills relevant to interdisciplinarity are taught. In this study, 21st century skills and interdisciplinarity were compared to construct a hypothesis on what skills are potentially being taught in the Big History course. Conclusions drawn for this hypothesis could define how Big History contributes to modernization of the Dutch educational system.

Twenty-first century skills have been defined in various ways in the past.[104] For this study several prominent works in the field have been analyzed. It appears as though 21st

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[98] David Christian, *Maps of Time: An introduction to Big History* (Berkeley: University of California Press, 2011), xxiv.

[99] Constance van Hall and Joris Burmeister, interview by Sannette van Noord and Maureen de Boer, personal interview (Hilversum, October 24, 2016), appendix II.

[100] Van Hall, *Big History: een vakoverschrijdende oriëntatie op de wetenschappen*, 15.

[101] Richard B. Simon, "What is Big History?" in *Teaching Big History* (University of California Press, 2015), 3-4.

[102] Michela Horvathova, "Basic Principles for Curriculum Redesign," in *Review Study of OECD Dutch Curriculum: Onderwijs 2032* (2015), accessed September 29, 2016, http://onsonderwijs2032.nl/wp-content/uploads/2015/09/OECD-Paper-4-BASIC-PRINCIPLES-FOR-CURRICULUM-REDESIGN.pdf.

[103] Ibid., 9.

[104] William F. McComas, "21st-century skills," in *The Language of Science Education*, (Rotterdam: SensePublishers, 2014), 1.

century skills can be arranged in three categories. The first category is 'digital literacy'[105] or 'tools for working'[106]. This category emphasizes the use of digital resources to one's best advantage. The second category focuses on citizenship, 'career and life'[107] or 'living in the world'[108], and revolves around skills such as responsibility and leadership. The final category is the most relevant in the context of this study: 'learning and innovation' or simply 'skills'. The skills in this category can be sorted into two sub-categories: 'ways of thinking' and 'ways of working'.[109] Ways of working roughly involves collaboration and communication skills. Ways of thinking involves higher-order thinking, specifically critical thinking, problem solving and creativity.

Interdisciplinary thinking and working usually revolves around problem solving.[110] Several authors, including most prominently Allen Repko, have identified skills useful or even necessary to the interdisciplinary problem-solving processes. Creativity (creative thinking)[111][112], communication (communicating competently)[113][114] and collaboration[115] are the three skills mentioned in this context equivalent to the previously discussed 21st century skills.

Because of the limited extent of this disciplinary study, only creativity and collaboration were subject to analysis in the Big History course. It is expected that both creativity and collaboration are encouraged and developed during a Big History course. The following paragraphs will discuss methods used for analysis, variables extracted for analysis, results and conclusions.

Method

In order to analyze creativity and collaboration skills in the Dutch Big History course, the course textbook was subject to textual analysis. This book contained textual explanations about subjects discussed in the course as well as several exercises. The content of the book

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[105] Bernie Trilling and Charles Fadel. *21st Century Skills: Learning for Life in Our Times*, (San Francisco: John Wiley & Sons, 2009), xxvi.

[106] Marilyn Binkley et al., "Defining Twenty-first Century Skills," in *Assessment and Teaching of 21st Century Skills* (Springer Netherlands, 2012), 18.

[107] Trilling and Fadel. *21st Century Skills: Learning for Life in Our Times*, xxvi.

[108] Binkley et al., "Defining Twenty-first Century Skills," 18.

[109] Ibid.

[110] Repko, *Interdisciplinary Research: Process and Theory*, 15.

[111] Ibid., 63.

[112] Shirley Vincent and Will Focht, "Interdisciplinary Environmental Education: Elements of Field Identity and Curriculum Design," *Journal of Environmental Studies and Sciences* 1 (2011), 23.

[113] Repko, *Interdisciplinary Research: Process and Theory*, 61.

[114] Elisabeth J.H. Spelt, et al., "Teaching and Learning in Interdisciplinary Higher Education: a Systematic Review," *Educational Psychology Review* 4 (2009), 372.

[115] Ibid.

was based on the information from the American Big History Project website, which has been translated to Dutch and edited to function within the course timeframe.[116] The author of the textbook, Constance van Hall, was also interviewed in the context of this study, along with her colleague Joris Burmeister, also a teacher of Big History. The semi-structured interview focused on classroom processes and explored both creativity and collaboration, as well as the position of Big History in the Netherlands. Findings on the latter were used throughout; creativity and collaboration are discussed in detail as part of the analysis. The structural questions in the interview were based on the following theories on encouragement and development of creativity and collaboration in education.

Creativity

New and innovative ideas are the drivers of today's economy.[117] Therefore, creativity is a valuable skill, as computers and robots are generally not capable of thinking creatively. Creative thinking involves several thinking processes.[118] The very nature of Big History might already involve these processes. Big History combines various disciplines to describe an ever-increasing complexity.[119] Combination thinking is when one takes two or more ideas and combines them so as to create a new, original idea.[120] To do this, associations between concepts have to be made, even if these associations are not clear-cut. Learners are encouraged to compare and connect the disciplines in Big History in the bigger picture of the universe.[121] Practice and example in combination thinking can already develop and encourage creativity in students.[122]

Combination thinking is one of many creative thinking processes in humans.[123] Apart from the fact that the very nature of Big History could already encourage students to be creative, there are several ways the Big History course could help develop and encourage creativity in students. Generally, creativity is encouraged by activities that explicitly ask students to be creative and by activities that require and therefore activate creative thinking

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[116] Van Hall and Burmeister, personal interview, appendix II.

[117] Horvathova, "Evidence About Knowledge and Skills for Work and Learning", 1.

[118] Anna Craft, "An Analysis of Research and Literature on Creativity in Education," *Qualifications and Curriculum Authority* (2001), 1-37.

[119] Simon, "What is Big History?" in *Teaching Big History*, 12.

[120] Theodore Lewis, "Creativity in Technology Education: Providing children with glimpses of their inventive potential," *International Journal of Technology and Design Education* 3 (2009), 264.

[121] Simon, "What is Big History?" in *Teaching Big History*, 12.

[122] Lewis, "Creativity in Technology Education: Providing children with glimpses of their inventive potential," 264.

[123] Mary Mayesky, *Creative Activities and Curriculum for Young Children* (Boston: Cengage Learning, 2014), 5-6.

processes.[124][125] For this study the activities in the Big History course materials were analyzed for both kinds of activities. Two creative thinking processes were selected for the textual analysis, divergent thinking and metaphorical thinking. Divergent thinking was selected for its consistent occurrence in literature on creativity; metaphorical thinking was selected for its workability in textual analysis.

Convergent thinking and divergent thinking are both very important to creativity.[126] The first is encouraged when there is only one correct answer to a question.[127] The latter is enhanced when there is an endless variety of possible answers to a question, and/or one is asked to come up with as many answers as possible.[128] Convergent thinking is often conditional to divergent thinking in problem solving, but both are equally important when it comes to creativity.[129] In education convergent thinking is often encouraged, because it makes knowledge and skills easier to teach and test. In order to encourage creativity, it is very important to promote divergent thinking in educational courses. Divergent thinking can be induced by asking a so-called divergent question; a question to which multiple answers are correct.[130][131] Such questions can be found in teaching materials aimed at helping students to better understand content, rather than evaluate their knowledge. Also, projects are useful to this end. In both cases instructions to 'think of as many answers as possible' are particularly helpful, as well as feedback to find other possible answers than the one given by the student.[132]

Metaphorical thinking processes are, like combination thinking, based on the ability of making unorthodox associations between concepts.[133] In education, metaphors are often used to explain new and/or abstract concepts by associating their features with those of a known concept and usually they involve imagery. The associations made are not clear-cut. An example is the Internet as an information highway. The Internet may not look like a highway, but seems to function as such to information as a highway does to cars. The comparison of the two concepts supplies imagery, as the invisible Internet is compared to a visible highway. The

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[124] Mayesky, *Creative Activities and Curriculum for Young Children*, 21.
[125] Craft, "An Analysis of Research and Literature on Creativity in Education," 9.
[126] Mayesky, *Creative Activities and Curriculum for Young Children*, 5-6.
[127] Anita Woolfolk, Malcolm Hughes and Vivienne Walkup, *Psychology in Education* (England: Pearson Education Limited, 2013), 361.
[128] Ibid.
[129] Mayesky, *Creative Activities and Curriculum for Young Children*, 5-6.
[130] Craft, "An Analysis of Research and Literature on Creativity in Education," 8.
[131] Woolfolk, Hughes and Walkup, *Psychology in Education*, 362-363.
[132] Mayesky, *Creative Activities and Curriculum for Young Children*, 5-6.
[133] Lewis, "Creativity in Technology Education: Providing children with glimpses of their inventive potential," 264.

use of metaphors in educational text and explanations stimulates metaphorical thinking in students.[134]

Collaboration

Collective learning is a central issue in Big History. In relation to the content of the course it is the ability that differentiates humans from animals. In collective learning, humans deliberately share their knowledge and skills with others.[135] Humans help each other and learn together. This is also central to the Big History course itself[136]. Working together is to learn together and achieve better results than a single individual would.[137]

Collaborating with colleagues or engaging in teamwork is quite common in the workplace, as it tends to lead to better results. However, this is not always the outcome of a collaborative effort.[138] To collaborate effectively and efficiently takes skill, which can be learned at school. In education collaboration is not only encouraged to teach collaboration skills, it can also lead to better learning results, as students work and learn together. However, to make sure students profit from collaboration in class now and in the future, they must be taught how to do so.[139]

Many different social skills contribute to successful collaboration processes.[140][141] However, *Platform Onderwijs2032* emphasizes learning to express one's opinions, dealing with the opinions of others, and feeling responsible for group work.[142] Practicing collaboration is not enough to learn how to collaborate well. Teachers have to support their students[143], encourage them to express their opinions and be responsible, and help them deal with other students' opinions or criticism.

Expressing one's opinion is part of participation[144], an important element of successful collaboration.[145] To have students participate, they must be offered time and space to do so,

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[134] Lewis, "Creativity in Technology Education: Providing children with glimpses of their inventive potential," 264.

[135] Van Hall, *Big History: een vakoverschrijdende oriëntatie op de wetenschappen*, 15.

[136] "Wetenschapsoriëntatie in het programma van Big History," accessed October 25, 2016, http://wetenschapsorientatie.slo.nl/vakken/bigh/.

[137] Ibid.

[138] Friedrich Hesse, et al., "A Framework for Teachable Collaborative Problem Solving Skills," in *Assessment and Teaching of 21st Century Skills* (Springer Netherlands, 2015), 41.

[139] Woolfolk, Hughes and Walkup, *Psychology in Education*, 482.

[140] Ibid.

[141] Hesse, et al., "A Framework for Teachable Collaborative Problem Solving Skills," 42.

[142] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies*, 43.

[143] Woolfolk, Hughes and Walkup, *Psychology in Education*, 479.

[144] Harry Shier, "Pathways to Participation: Openings, Opportunities and Obligations," *Children & Society* 2 (2001), 109-110.

[145] Hesse, et al., "A Framework for Teachable Collaborative Problem Solving Skills," 42.

sometimes explicitly. Acting on the opinions that are expressed can further encourage participation. When students feel their opinions are being taken into serious consideration when decisions are made, they can also start feeling responsible for the outcomes.[146] Therefore, by offering students space to voice their opinion and making sure their opinions are taken seriously, responsibility can be encouraged indirectly. Course materials were analyzed for questions explicitly asking students to express their opinions, such as 'what do you think is most important to facilitate life on earth?' It was also evaluated whether these questions were then discussed or acted on in class.

Besides offering students space to express their opinions, once expressed these opinions also have to be received respectfully, not only by a teacher but also by peers. This tends to be a problem among teenagers, as bullying is common to this age group.[147] Preventing bullying and facilitating positive group processes is very important to get students to participate by expressing their opinions.[148] However, how these situations are handled is usually up to the teacher not the course at hand.[149] Therefore, this topic was only briefly explored, for if there were any explicit regulations in the course material, teachers could potentially ignore them by choice.

In sum, the text in the learning material was analyzed for the usage of metaphors to explain new concepts. The exercises in the material were analyzed for explicit encouragement of students to be creative, the usage of divergent questions and questions encouraging students to express opinions. Group projects were analyzed for encouragement of divergent thinking processes and group process regulations. All analyses were exploratory and the interview with Constance van Hall and Joris Burmeister complemented the results.

Results

This section discusses results of the exploratory analyses on creativity and collaboration in Big History. Since the analyses were exploratory, unrelated yet interesting findings were also reported.

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[146] Shier, "Pathways to Participation: Openings, Opportunities and Obligations," 109-110.
[147] Woolfolk, Hughes and Walkup, *Psychology in Education*, 492-493.
[148] Shier, "Pathways to Participation: Openings, Opportunities and Obligations".
[149] Woolfolk, Hughes and Walkup, *Psychology in Education*, 493-495.

Creativity

Textual analysis of the course material showed that at least twelve potential metaphors were used to help explain complex matters such as time, the size of atoms, distances in space and DNA. Analysis of the exercises even found three potential questions involving the use of metaphors, requiring students to create or explain one. Also, at least sixteen divergent questions were identified, of which several explicitly encouraged students to 'be creative!'

Van Hall explained in the interview that the subject of creativity is discussed extensively as students are vocally encouraged to be creative, just as scientists have to be creative. In their lectures they try to emphasize that scientists could have never come up with their theories that they did if they weren't thinking out-of-the-box. In group projects original ideas are supported, which even led to an increase of original and creative projects in the entire curriculum.

Collaboration

Sixteen different questions explicitly asked students to express their opinions about matters discussed in the previous text. Van Hall and Burmeister added that these questions are not widely discussed in class due to a small timeframe. Students only voice their opinions in class when they feel comfortable enough to do so. Van Hall and Burmeister explained that this depends on how comfortable students are with each other, and that this is different to every class they teach. When opinions are discussed they try to help students support their argument with scientific claim testers. They also try to encourage other students to be critical towards the opinions of others.

Two group projects were identified. Van Hall explained that students are encouraged to explore science and their interests on their own, as group projects are already very common to the school's curriculum. Group processes were not explicitly guided (by teachers). Students were not required to report about group processes.

Other findings

- Group projects, along with two separate questions, asked students to reflect on their actions and feelings.
- Exploring one's interests was not only encouraged by solo projects, three exercises required students explicitly to express and/or act on their specific interests.

- Four different exercises required students to express a scientific opinion, meaning they would have to use scientific claims to support their statements.
- Van Hall and Burmeister emphasize their focus on scientific research and writing. Students are required to explore scientific topics online and present their finding. The final project of the course involves an individual project to write a scientific paper.

Discussion & Conclusions

The aim of this study was to investigate whether the Big History course in Dutch high schools could contribute to future-oriented education by teaching 21st century skills. Considering the interdisciplinary nature of Big History, encouragement and development of 21st century skills creativity and collaboration were analyzed in the course material. This exploratory analysis revealed that creativity is a highly encouraged skill in Big History. Not only were students explicitly encouraged to be creative in various ways; necessary creative thinking processes were activated. Collaboration was however encouraged and developed less. Although expressing one's opinion, essential to encouragement of participation, was stimulated in the material, there were few group projects and group processes were not explicitly guided.

The other findings in the exploratory analysis will be further discussed as to whether they could support the statement that Big History could contribute to future-oriented education. First, reflecting on one's actions and feelings was found to be of importance in Big History. Reflection was considered a skill relevant to interdisciplinarity[150], therefore it not unexpected that this skill is encouraged. More notable however, was the great emphasis on the exploration one's own interests. Along with reflection this might contribute to personal development of students. Both reflection and exploring and acting on interest have been linked to motivation for learning, an aspect of personal development.[151] *Platform Onderwijs2032* highly emphasizes personal development and states that students should be encouraged to reflect on their drives, in their interaction with other people, and ambitions, as to their potential career.[152] This was found to be encouraged in the Big History course, as the reflectional exercises focus on personal relations to others and the emphasis on exploration of interests also included questions on potential ambitions in relation to those interests.

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[150] Spelt, et al., "Teaching and Learning in Interdisciplinary Higher Education: a Systematic Review," 372.

[151] Michaela Horvathova, "Personal Development," in *Review Study of OECD Dutch Curriculum: Onderwijs 2032* (2015), 1-9, accessed November 20, 2016, http://onsonderwijs2032.nl/wp-content/uploads/2015/09/OECD-Paper-3-PERSONAL-DEVELOPMENT.pdf.

[152] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies*, 26.

Two other findings both underscore the scientific element of the course. Expressing a scientific opinion, using scientific claims, doing scientific research and writing a scientific paper all derive from scientific aspect of the course. The findings suggest that within this aspect persuasive as well as informative communication is key. As was mentioned in the introduction of this chapter, communication is a 21st century skill as well as an interdisciplinary skill. Due to the limited extent of the study this skill was however not specifically explored. The fact that the exploratory analysis of the course did reveal emphasis on communication skills supports the statement that Big History could contribute to future-oriented education, along the line of reasoning in this study. The targeted communication can now also be specified as persuasive and informative.

In conclusion, Big History can contribute to future-oriented education, and therefore to modernization of the Dutch educational system, because it actively encourages and stimulates the development of 21st century skills creativity and, to a lesser extent, collaboration and communication as well as the interdisciplinary skill of reflection, which along with the educational focus on the exploration of students' interests makes for an indirect contribution to their personal development.

Chapter 4: Integrating Disciplinary Insights

The last three chapters illustrated the separate disciplinary contributions to the research question: to what extent can Big History contribute to the modernization of the Dutch educational system? The present chapter aims to integrate the three disciplinary insights to create a more comprehensive, holistic answer to this interdisciplinary question.

This chapter will be split into four sections. The researchers begin by discussing the conflicts and intersections between two key concepts of the research question, namely that of "modernization (of education)" and "Big History", by reflecting on the perspective, assumptions and research methods of their respective disciplines. The common ground is offered next. The researchers map the problem and explain the interrelation of disciplinary assumptions and concepts through an organizational model (see Figure 1). They reconcile the divergent disciplinary insights by clustering these in three domains, namely "vision", "skills" and "knowledge". It must be clear, however, that the common ground is not the same as the process of integration.[153] The common ground and integration techniques, such as expansion and redefinition, serve merely to reconcile concepts that do not, at first instance, connect, for example, interdisciplinarity and (global) citizenship. Hence, these means enable the integration of – and subsequently collaborative communication between – disciplinary insights. Finally, the researchers explain how the integration of divergent insights offers a new, holistic answer to the research question.

Identifying disciplinary conflicts and intersections

In order to evaluate to what extent Big History can contribute to modernization of the Dutch educational system, the researchers must first define two central concepts of the research question, namely "modernization (of education)" and "Big History". These concepts were discussed by all the disciplines involved but defined differently. The characteristics attributed to these concepts will be summarized and, by means of extension, new, all-encompassing definitions will be formulated in the following subsections.

Extending Modernization (of Education)

One of the fundamental concepts of the present thesis is the concept of "modernization (of education)". In order to understand Big History's contribution to the modernization of the

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[153] Repko, *Interdisciplinary Research: Process and Theory*, 322.

Dutch educational system, it is crucial to comprehend how each discipline defines "modernization" in the first place.

The historian interpreted modernization in terms of a *modern Creation Myth*, because this myth is based on modern scientific techniques and knowledge. In this context, "modernization" is defined in terms of keeping up with recent developments and modern scientific techniques. Both philosophy and educational science used *Platform Onderwijs2032* as a fundament to their concept of modernization. Each discipline defined this concept, however, in ways that privilege their own field of expertise. The philosopher described modernization in *progressivist* educational terms, i.e. relevant, up-to-date, and interesting education. The educational scientist, on the other hand, interpreted modernization in terms of 21st century education and emphasized the relevance of *21st century skills* to future-oriented education.

In order to create common ground among the separate disciplines, it becomes necessary to extend the concept of "modernization" to create a definition that encompasses all three disciplinary insights.[154] The researchers will, therefore, increase the conceptual scope of this concept and define "modernization" as *the act of keeping up with contemporary developments by means of involving relevant issues and modern scientific techniques as well as teaching 21st century skills and scientific knowledge, in order to prepare students for living and working in the society of the future.*

Extending Big History

A second fundamental concept of our research question is that of "Big History". It is only possible to understand the extent to which Big History can contribute to modernization of education if we agree on what Big History entails.

Historical insights offered an in-depth understanding of the origins of Big History and its position in the historiographical debate. Big History aims at mapping the total history of the universe while structuring a timescale based on increasing complexity. It can be described as a new kind of Universal History rooted in general scholarly knowledge and under the conduct of scientific standards. Its global view, i.e., the map history in its entirety, sparks a perception of global citizenship by relocating humans in their biosphere.[155] Hence, it is argued that Big History's global view promotes global citizenship. The philosophical and educational

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[154] Repko, *Interdisciplinary Research: Process and Theory,* 340.
[155] David Christian, "The Return of Universal History," *History and Theory* 49 (December 2010), 25.

insights complemented this interpretation of Big History by accentuating its educational characteristics. It was argued that the flexible and adjustable content of Big History facilitates the teacher's position shift into a lead learner role because it offers the teacher the possibility of applying Big History as he sees fit. It also became clear that Big History promotes the development of interdisciplinary skills exactly because it integrates various disciplinary insights into its global view of history.

By evaluating the different characteristics appointed to Big History, seven key aspects emerge from which an all-encompassing description can be constructed. The concept of Big History will thus be understood as "equipping students with *general knowledge* of the universe in unity and complexity by constructing a *scientific view* of history through the integration of various disciplinary insights, i.e. by relying on *interdisciplinarity*. Furthermore, Big History's *global view* aims at promoting *global citizenship* by illustrating the relation between mankind and its biosphere, i.e. by accentuating unity. In an educational sense, the *flexible and adjustable content* of Big History enables the teacher's shift to the role of *lead learner* in the course."

Clustering Vision, Skills and Knowledge

The disciplinary insights regarding the potential contribution of Big History to the modernization of the Dutch educational system overlap on three different domains: vision, skills and knowledge. These clusters help create common ground because they make intersections between the separate disciplinary insights, and their respective distinct variables, visible. The organizational model below (see Figure 1), maps the two defined concepts and creates common ground between them by demonstrating how the clusters and respective insights integrate.
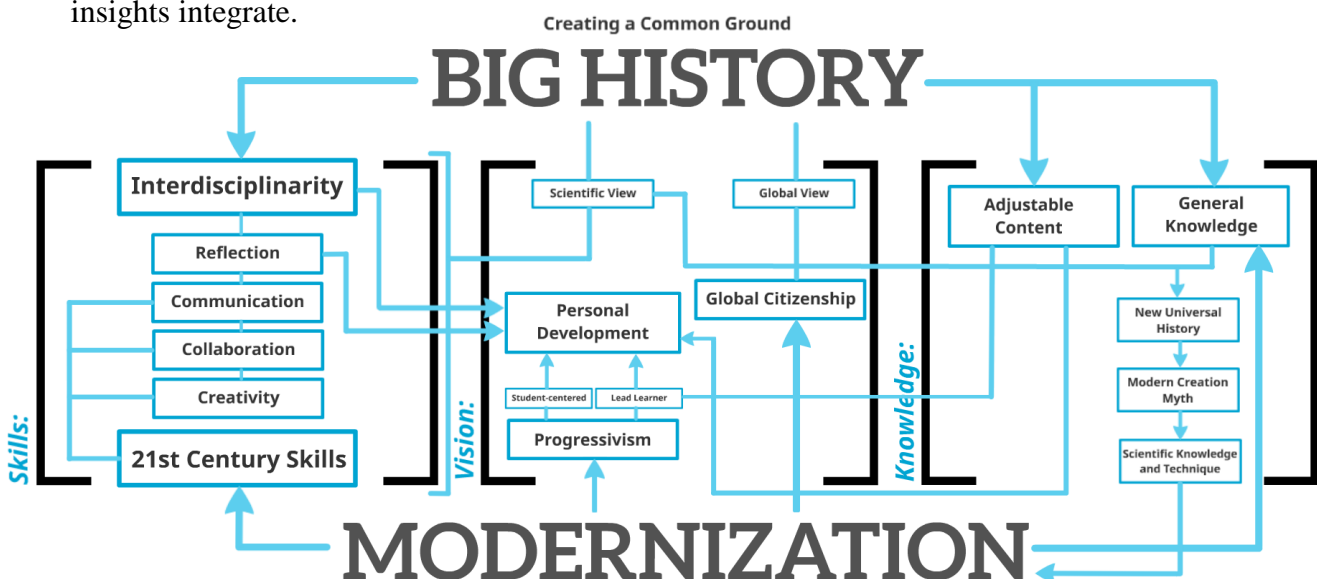

Figure 1 Creating a Common Ground: Organizational Model

Each discipline focused mainly on one of these clusters. History focused particularly on the "knowledge cluster". It offered a deeper understanding of the contents of Big History – i.e. the knowledge it transmits – by inquiring into its origins and positioning it in the historiographical debate. Philosophy discussed the Platform's perspective on the modernization of the Dutch educational system – i.e., its vision – and inquired whether Big History can contribute to these ends. Educational science offered instead an explorative, empirical research on the skills that Big History courses can help develop, thus contributing to the "skills cluster". During the integrative process, it became clear that the three disciplinary insights contributed to more than one of these clusters; i.e., each cluster is "inclusive of the relevant disciplinary insights but not dominated by any of them"[156]. The three clusters map the overlap between the different disciplinary insights and show where the involved disciplines share a point of common interest. The following sections demonstrate how the divergent disciplinary insights intersect and integrate in each domain, i.e., their common ground.

Clustering Vision

The modernization of Dutch secondary schools aims primarily at *personal development*, *general knowledge* and *(global) citizenship*. This is also the reason why these concepts have a larger letter type in the organizational model above. Admittedly, only two of these goals
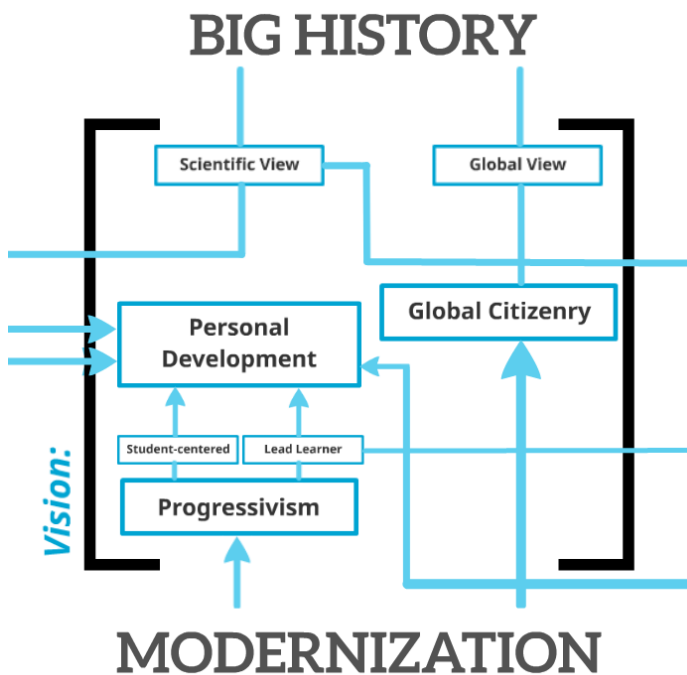
Figure 2 Creating a Common Ground: Vision Cluster

belong in the "vision cluster" (see Figure 2). The development of *general knowledge* has more to do with the contents of – or, knowledge transmitted by – future-oriented education and will, therefore, be discussed in the "knowledge cluster". The other two goals are clearly part of the Platform's vision of modernization, i.e. what the modernization of the Dutch educational system must realize on a societal level. All disciplines involved, collaborate in this cluster.

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[156] Repko, *Interdisciplinary Research: Process and Theory*, 287.

It is highly unlikely that Big History could have been linked to the Platform's vision without the philosophical and educational insights on the matter. Big History *an sich* does not, for instance, explicitly emphasize the need for *personal development* but both philosophy and educational science argued that it can contribute to this goal nonetheless. Philosophy linked Big History to personal development through the "lead learner" role of teachers. It was argued that Big History explicitly recommends a shift in the teacher's authoritarian role to a more flexible, "lead learner" position. This shift enables teachers to adjust their subject-matter in such a way that fits in with the student's interests and capabilities and thus encourages the *personal development* of students. Educational science, on the other hand, illustrated the link between Big History and personal development by arguing that the reflective skills stimulated by Big History, as well as its focus on individual interests, facilitate the student's motivation for learning, i.e., an important aspect of *personal development.* Hence, the idea that Big History can contribute to personal development creates common ground between philosophy and educational science.

It is impossible to understand the contribution of Big History to the development of *citizenship* without the insights of history. As mentioned before, the historian described Big History in terms of an historical *global view*. It serves as a map that constructs the shared history of humanity in its entirety. This function of Big History has a clear ideological component: by placing the history of humanity in a larger context, it aims at creating solidarity between nations, cultures and religions.[157] In other words, it wishes to foster *global citizenship*. This *global view* links Big History to yet another goal of the Platform, namely citizenship. The researchers acknowledge, however, that there is a discrepancy in the scope of the Platform's concept of "*citizenship*" and that of Big History. The Platform's concept refers primarily to being a citizen of *a particular* country.[158] This definition of citizenship obviously does not embrace the global character of Big History's concept of *global citizenship*. The discrepancy obstructs the connection between Big History and the modernization of education and must, therefore, be addressed.

One of the premises of our definition of modernization as discussed above, is that students ought to be prepared for living and working in the society of the future. It is hard to tell what the society of the future will look like exactly, but if it is anything like our contemporary society, it seems safe to assume that students must be prepared for a globalizing

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[157] David Christian, *Maps of Time: An introduction to Big History* (Berkeley: University of California Press, 2004), 8.
[158] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies*, 34-35.

world. Globalization is of pivotal relevance to the present society and its impact is only expected to grow in the future. Hence, a nationalistic definition of citizenship becomes insufficient if aimed at preparing students for the future. The researchers of this study argue, therefore, that it is necessary to redefine the concept of citizenship in order to facilitate the connection between Big History and modernization (of education). By redefining citizenship in global terms, i.e., being a citizen of *any* country, the researchers create a common vocabulary.[159] *Global citizenship* accommodates the global developments in our contemporary and future society, allows for communication between disciplinary insights and links Big History to our redefinition of modernization (of education).

Clustering Skills

The Platform also mentions desirable skills of future-oriented education. In particular, *Platform Onderwijs2032* emphasizes the need for interdisciplinarity in subject-matter.[160] Interdisciplinarity is often defined as the integration of

> "knowledge and modes of thinking drawn from two or more disciplines to produce a *cognitive advancement* – for example, explaining a phenomenon, solving a problem, creating a product, or raising a new question – in ways that would have been unlikely through single disciplinary means."[161]

Figure 3 Creating a Common Ground: Skills Cluster

The concept of "interdisciplinarity" is a key to the "skills cluster" (see Figure 3) and explored by all disciplines involved in the current thesis.

The historian described the interdisciplinary character of Big History. As mentioned before, it was argued that Big History is interdisciplinary because it unites a wide-range of disciplines. It uses thresholds to integrate numerous insights and theories into one coherent history of increasing complexity. This historical description of interdisciplinarity
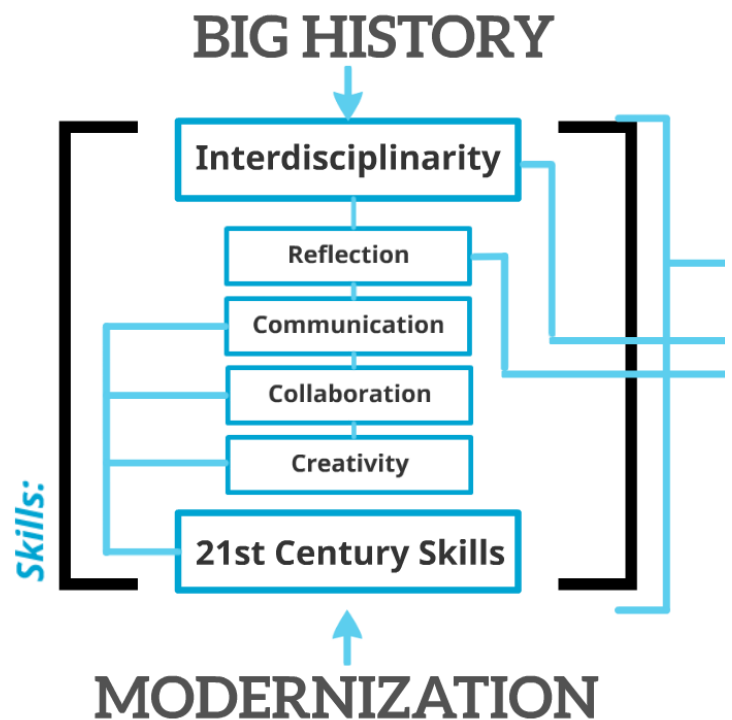
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[159] Repko, *Interdisciplinary Research: Process and Theory*, 336.
[160] Platform Onderwijs2032, *Ons Onderwijs 2032: Eindadvies*, 40.
[161] Repko, *Interdisciplinary Research: Process and Theory*, 15.

is thus very similar to the description above, for it defines interdisciplinarity as the integration of relevant disciplinary insights, from the humanities to the sciences. The historical insights on the interdisciplinary character of Big History gave more substance to the assumption made by both philosophy and educational science. In other words, history actually offered reasons as to why Big History is indeed interdisciplinary, while both philosophy and educational science simply took this as a stated fact.

Philosophy did not offer a specific definition of interdisciplinarity but it did describe what interdisciplinary skills can help accomplish, thus linking the "skills cluster" to the "vision cluster". In this context, interdisciplinarity has an instrumental purpose, namely facilitating the *personal development* of students by aiding the integration and continuity of experiences. According to Dewey, genuine knowledge can only be attained through the integration and continuity of the individual's experiences.[162] Consequently, it was argued that interdisciplinary skills can facilitate the integration and continuity of such experiences. The philosopher interpreted "interdisciplinarity" thus in progressivist terms and argued that it can be applied as means to the Platform's end.

The educational insights proved yet another link between the "skills cluster" and the "vision cluster". The exploratory research revealed that 21st century skills, namely communication, collaboration and creativity, together with reflection, are taught in Big History courses due to its interdisciplinary character. All these skills are also relevant to the scientific view of Big History, part of the "vision cluster", as these skills are important to pursue science in general. This scientific aspect is further connected to the modernization (of education) through the "knowledge cluster" offered in the next section.

The varying disciplinary insights on the concept of interdisciplinarity obstruct the communication between disciplinary insights, thus raising the necessity to extend the concept of interdisciplinarity to create common ground. The researchers decided to increase the conceptual scope of "interdisciplinarity" by extending its meaning beyond the domain of the single disciplines into an all-encompassing, discipline-independent definition of the concept.[163] "Interdisciplinarity" will, therefore, hereinafter be described as the integration of

> "knowledge and modes of thinking drawn from two or more disciplines to produce a *cognitive advancement* – for example, explaining a phenomenon, solving a problem, creating a product, or raising a new question – in ways that would have been unlikely through single disciplinary means, while simultaneously promoting *personal*

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[162] John Dewey, *Experience and Education* (New York: Simon & Schuster, 1997).
[163] Repko, *Interdisciplinary Research: Process and Theory*, 340.

development through the integration and continuity of the student's experiences as well as the development of interdisciplinary *skills*."[164]

Clustering Knowledge

This cluster (see Figure 4) focuses particularly on the content of Big History. It illuminates how Big History can contribute to one of the Platform's goals, namely *general knowledge*, and how this interrelates with the other clusters.

Firstly, and as mentioned in the "vision cluster" section, it was argued that the adjustable content of Big History facilitates the shift of teachers and that it, therefore, indirectly promotes the personal development of students by offering subject-matter fitting to their interests and capabilities. This intersection between the clusters vision and knowledge has been explained extensively and will, therefore, not be considered in the present section.

The second link is achieved through the grouping of the concepts "scientific view" and "general knowledge" (see Figure 1). Each concept belongs to a different cluster but together they compose the internal structure of Big History. The historical insights on the content and origins of Big History explained that Big History can be considered a new Universal History that is "global in its practice and scientific in its spirits and methods".[165] In other words, Big History harvests general knowledge through its desire to tell the complete history of the universe. This modern Creation Myth relies on scientific knowledge and techniques, such as radiometric dating techniques, so as to yield relevant and

Figure 4 Creating a Common Ground: Knowledge Cluster

scientifically correct historical insights. The emphasis of Big History on a scientific view of

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[164] Repko, *Interdisciplinary Research: Process and Theory*, 15.

[165] David Christian, "The Return of Universal History," *History and Theory* 49 (December 2010), 6.

the universe, together with the general knowledge it yields, positions the discipline within the realm of Universal History. The scientific knowledge and techniques used in Big History courses, contribute greatly to the modernization of education.

A More Comprehensive Understanding

The search for common ground offers a more comprehensive answer to the research question. Repko states that "a more comprehensive understanding is the integration of insights to produce a new and nuanced whole."[166] Indeed, the integration of the various disciplinary insights resulted in a new and nuanced answer. One which confirms that – and demonstrates how – Big History can contribute to the modernization of Dutch secondary schools as set forth by *Platform Onderwijs2032*.

The two key concepts expanded in the first section – Big History and modernization (of education) –, revealed commonalities between disciplinary insights. The researchers then created common ground by grouping their respective insights in three clusters – vision, skills and knowledge. It became clear that each cluster combined more elements than any single disciplinary understanding, which facilitated the integration of the unique knowledge possessed by each area of expertise. This process of integration offers an understanding that, though responsive to the differing disciplinary perspectives, is not dominated by any of them.[167]

Big History can contribute to the modernization of the Dutch educational system because it directly, and indirectly, contributes to the goals set by the Platform. For starters, Big History fosters the interdisciplinary and 21st century skills desired by the Platform. The development of these skills, together with the adjustable content of the course and the repositioning of teachers in a lead-learner role, all contribute, in turn, to perhaps the most prominent goals of the Platform: the student's personal development. As argued in the "vision cluster", Big History's global view of history also helps develop a second goal of modernization: *global citizenship*. Big History fosters a sense of global citizenship by relocating mankind in the biosphere. The integration of disciplinary insights also shows that Big History's scientific view and employment of *interdisciplinary skills*, contribute greatly to the development of the third goal, *general knowledge*. In short, Big History fits our definition – and helps develop the goals – of "modernization (of education)". Hence, it is possible to

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[166] Repko, *Interdisciplinary Research: Process and Theory*, 382.
[167] Ibid., 383.

incorporate the separate disciplinary insights into one, holistic explanation: Big History can significantly contribute to the modernization of the Dutch educational system.

Chapter 5: Interdisciplinary Discussion

The integration of the differing contributing disciplines is one of the obvious benefits of interdisciplinary work. Without it, it would not have been possible to attain the more comprehensive answer to the interdisciplinary question presented previously. The unique fields of expertise, and the balance and complementation of their respective insights, created the possibility to understand the issue at hand with clarity: Big History can contribute to the modernization of the Dutch educational system. It is, however, worth explaining certain choices made by the researchers and self-reflecting on the limitations of this thesis. This is the aim of the present chapter.

The integration of historical insights presented quite a challenge to the researchers. Initially, it seemed evident that history could provide relevant insights on Big History, since its name gives the impression that it is comparable to regular history. It became clear, however, that history focused primarily on theoretical, i.e. academic, aspects of Big History, while the remaining disciplines chose to focus on the practicality of Big History courses. The integration of disciplinary insights on Big History was, therefore, only possible on a conceptual and organizational level. This is not to say that the historical insights were irrelevant. By inquiring into Christian's vision – which is central to Dutch Big History courses –, the historian uncovered the origins, goals, and relevance of the sub discipline. The remaining disciplines would not have been able to illustrate the contemporary importance of Big History nor deliver the arguments that this inquiry provided. Hence, the researchers stand by their choice to involve history in this interdisciplinary case study.

Philosophy offered educational insights on a meta-level by investigating the nature of the Platform's vision on the modernization of Dutch secondary schools, i.e. its underlying philosophy of education. It was concluded that Progressivism fitted best with the existent framework of future-oriented education, but it is acknowledged that others might disagree. A different philosopher can make different assumptions and reach different conclusions. Humanistic educational philosophies are, for instance, very similar to the Platform's vision on certain aspects. Both humanistic and progressivist teachers argue that the students' learning should be self-directed, i.e. fitting to the students' needs and interests. Progressivism does not, therefore, necessarily rule out the correct application of other educational theories on the Platform's vision. Nonetheless, the philosopher believes that Progressivism provides a more inclusive understanding of *Platform Onderwijs2032* than any other educational philosophy.

The current research question "to what extent can Big History contribute to modernization of the Dutch educational system?" is potentially biased. By focusing on the

extent to which Big History can contribute to the modernization of Dutch secondary schools, the researchers presume that Big History has, in fact, the potential to contribute. The present thesis did not explore whether there are arguments to why Big History *cannot* contribute to modernization of the Dutch educational system. The researchers concluded that it would be impossible – though most importantly, unproductive – to encompass this aspect in the limited extent of this thesis. To do so, would be at the expense of the quality of the arguments already provided.

Also, it is rather unusual to the humanities, such as history and philosophy, to use the governmental report of *Platform Onderwijs2032* as the foundation of an academic case study without reasoning or arguing for or against it. The researchers decided, however, that doing this would be of little significance to their aim. After all, this thesis does not aim to discuss the righteousness of *Platform Onderwijs2032 an sich*, but rather to inquire into the potential contributions of Big History to the modernization of education. The Platform serves, then, merely as a notion of the government's view on the modernization of the Dutch educational system.

Finally, one of the most prominent critiques on the Platform's plans states that teachers are not offered the necessary resources to actively engage in the design of the curriculum.[168] That is not to say that they do not have the necessary skills, but rather that they do not have the time, as teachers would have to work extra hours, which is in turn too expensive. Due to expected budget cuts, critics argue that the Platform's plans are unrealizable. This assessment may initially seem threatening to the present thesis: if the Platform's plans are unrealizable, and the potential contribution of Big History is grounded in these plans, then Big History's contribution must be inaccessible as well. The researchers believe, however, that it is a mistake to think that Big History's contribution is in any way dependent on the Platform's insights. Whether the Platform's plans are realizable or not, it is clear that Big History can, in theory, help modernize the school's curriculum regardless of whether teachers have the necessary resources.

Call for action

The researchers acknowledge, however, that Big History's potential contribution to the modernization of education is only *fully attainable* if, as rightfully argued by critics, educators

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[168] Laura van Baars, "Leraren weten niet wat ze aanmoeten met 'Onderwijs 2032'," Trouw, November 18, 2016, accessed November 19, 2016, http://www.trouw.nl/tr/nl/39683/nbsp/article/detail/4417842/2016/11/18/Leraren-weten-niet-wat-ze-aanmoeten-met-Onderwijs-2032.dhtml.

possess the proper recourses. Van Hall, for instance, also addresses the heavy workload teachers have to deal with. She also explains that Big History is often applied inconsistently, as there are few guidelines. Teachers are usually intrinsically motivated to teach the course and tend to apply their own personal vision in it, causing inconsistencies in the Dutch Big History education. Accordingly, Van Hall stresses the need of more solid teaching practices in Big History courses.[169] In order to make Big History's contribution to a more modern curriculum successful, proper resources have to be made available. In addition, the researchers argue that sufficient class hours must be assigned in order to reduce the workload of educators.

Both the researchers and Van Hall argue for proper training of Big History teachers in order to ascertain the consistency and quality of Big History's teachings. Training provides the teacher with the necessary resources to teach such a variety of subjects and disciplines in a comprehensive and coherent way, thus safeguarding Big History's valuable contribution to the modernization of the Dutch educational system. Hence, the researchers took the first step and started a petition. Visit the following website and help us reshape the modernization of the Dutch educational system through proper education of Big History by signing the petition: http://petities.nl/petitions/big-history-moet-professioneel-worden-onderwezen-op-het-vwo?locale=nl. Your help is vital to our success.

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[169] Van Hall and Burmeister, personal interview, appendix II.

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Appendix 1: Data Management Table

Literature	Concepts	Relevant content summary	Discipline
"Summary of Big History Project Research – 2014/15 School Year." Big History Project. 2-22. Accessed November 11, 2016. https://www.bighistoryproject.com/media/bhp-assets/Summary-of-BHP-Research.pdf.	Big History; Role of students; Role of teachers.	Summarizes research on the possibilities offered through the Big History course.	Philosophy
"Wetenschapsoriëntatie in het programma van Big History." Accessed October 25, 2016. http://wetenschapsorientatie.slo.nl/vakken/bigh/.	Big History.	Describes Big History as a course of science orientation.	Educational Science
"What is Big History Project?" Big History Project. Accessed November 2, 2016. https://school.bighistoryproject.com/bhplive.	Big History.	Discusses the goals and possibilities offered through the Big History course.	Philosophy
Abbott, S. "Student-Centered Learning." In *The Glossary of Education Reform*. Last modified July 5, 2014. Accessed November 4, 2016. http://edglossary.org/student-centered-learning/.	Student-centered education.	Definition of student-centered education.	Philosophy
Armitage, David. "What's the Big Idea? Intellectual History and the Longue Durée." *History of European Ideas* 4 (2012), 493 – 507.	Deep history; World history.	This article contributes to the understanding of the sub disciplines world history and deep history. World history focusses on the Anthropocene. Deep history focusses on the pre-history.	History
Bierema, Laura L. "Philosophy of Organizational Learning." In *Philosophy and Practice of Organizational Learning, Performance and Change*, edited by Jerry W. Gilley, Peter Dean, Laura L.	Purpose of education.	This article offered relevant insights regarding the purpose of education and the importance of understanding its underlying philosophy.	Philosophy

Bierema, 13 – 40. Cambridge: Perseus Publishing, 2013.			
Binkley, Marilyn, Ola Erstad, Joan Herman, Senta Raizen, Martin Ripley, May Miller-Ricci, and Mike Rumble. "Defining Twenty-First Century Skills." In *Assessment and Teaching of 21st Century Skills*, 17 – 66. Dordrecht: Springer Netherlands, 2012.	21st century skills.	Ten different skills sorted in four categories: ways of thinking, ways of working, tools for working, and living in the world.	Educational Science
Christian, David. "The Return of Universal History." *History and Theory* 49 (December 2010), 6 – 27.	The history of Big History; The discipline Big History; New Universal History; Modern Creation Myth; Global citizenship.	Big History is a new kind of Universal History. Big History composes a coherent story of the whole of history, i.e., Modern Creation Myth. At the end of the 19th century the traditional Universal History vanished, i.e., modern history Universal History was criticized by modern historians as they refuted the grand narrative. Big History has an instrumental purpose: it creates maps that help to create awareness for a shared history, thus leading to global citizenship. It also emphasizes the complex relation between humans and the biosphere	History
Christian, David. *Maps of Time: An Introduction to Big History*. Berkeley: University of California Press, 2004.	Big History as an ideology.	Christian argues that focussing on the division between nations, religions and cultures in studies is harmful in a world with ecological problems and nuclear weapons. A study that unites is consequently less harmful. Big History contributes to a bigger project, i.e., a more unified	History

		vision of history and knowledge in general.	
Christian, David. *Maps of Time: An Introduction to Big History.* Berkeley: University of California Press, 2011.	Big History; Interdisciplinarity.	Big history has an interdisciplinary nature and seeks for an underlying unity in the past.	History
Craft, Anna. "An Analysis of Research and Literature on Creativity in Education." *Qualifications and Curriculum Authority* (2001), 1 – 37.	Creativity.	Overview of findings in the field up until 2001. Discussions on encouragement of creativity, definitions of creativity, high and low creativity and developments in the field.	Educational Science
Dewey, John. *Experience and Education.* New York: Simon & Schuster, 1997.	Progressivism.	This book offers Dewey's educational philosophy of Progressivism.	Philosophy
Hall, Constance van. *Big History: een vakoverschrijdende oriëntatie op de wetenschappen.* Amsterdam: Uitgeverij Boom, 2015.	Big History; David Christian.	Dutch course textbook of the Big History course, based on the Big History Project website. Also describes how David Christian became intrigued by big questions and ultimately Big History.	History Philosophy Educational Science
Hesse, Friedrich, Esther Care, Juergen Buder, Kai Sassenberg, and Patrick Griffin. "A Framework for Teachable Collaborative Problem Solving Skills." In *Assessment and Teaching of 21st Century Skills*, 37 – 56. Dordrecht: Springer Netherlands, 2015.	Collaboration.	Analysis of skills for collaborative problem solving. Collaboration is discussed separately and a list of relevant skills is presented.	Educational Science
Horvathova, Michaela. "Basic Principles for Curriculum Redesign." In *Review Study of OECD Dutch Curriculum: Onderwijs 2032.* Organisation for Economic Co-operation and Development (2015), 1 – 29. Accessed September 29 2016. http://onsonderwijs2032.nl/wp-	Future-oriented education.	Describes principles and content of 21st century education.	Educational Science

content/uploads/2015/09/OECD-Paper-4-BASIC-PRINCIPLES-FOR-CURRICULUM-REDESIGN.pdf.			
Horvathova, Michaela. "Evidence About Knowledge and Skills for Work and Learning." In *Review Study of OECD Dutch Curriculum: Onderwijs 2032*. Organisation for Economic Co-operation and Development (2015), 1 – 9. Accessed October 12, 2016. http://onsonderwijs2032.nl/wp-content/uploads/2015/09/OECD-Paper-1-EVIDENCE-ABOUT-KNOWLEDGE-AND-SKILLS-FOR-WORK-AND-LEARNING.pdf.	Future-oriented education.	Describes changes in the economy and workforce in the 21st century and why different skills are needed to join the future workforce.	Educational Science
Horvathova, Michaela. "Personal Development." In *Review Study of OECD Dutch Curriculum: Onderwijs 2032*. Organisation for Economic Co-operation and Development (2015), 1 – 9. Accessed November 20, 2016. http://onsonderwijs2032.nl/wp-content/uploads/2015/09/OECD-Paper-3-PERSONAL-DEVELOPMENT.pdf.	Future-oriented education.	Describes personal development and factors that contribute to personal development of students.	Educational Science
Hostee, G. and Denis Doeland. "Inleiding." In *VanAnaloogNaarDigitaal.nl – De Digitale Verandering* (2014), 7 – 15. Accessed September 28, 2016. http://www.vananaloognaardigitaal.nu/inleiding-van-analoog-naar-digitaal-2/.	Third Industrial Revolution; Digital Revolution.	Describes the drastic societal changes brought about by technology and offers a description of the Digital Revolution.	Philosophy

Hughes-Warrington, Marnie. "Big History*." *Social Evolution & History* 1 (March 2005), 7 – 21.	David Christian; Big History; Macrohistory; postmodernists; Anthropocentrism.	Describes the origins of the discipline. Big historians explore patterns of balance and imbalance between order and disorder, but they often use different conceptual frames. In 2005 Big History was still identified as macrohistory, i.e., a work in progress. Postmodernists say Big History is a mythology that serves the white and educated males. Big History veers away from total anthropocentrism.	History
Lewis, Theodore. "Creativity in Technology Education: Providing children with glimpses of their inventive potential." *International Journal of Technology and Design Education* 3 (2009), 255 – 268.	Creativity.	Describes divergent thinking, combination thinking and metaphorical thinking as creative thinking processes. In technology education these thinking processes are possibly part of the learning process. Because of this technology education could encourage creativity in students.	Educational Science
Mayesky, Mary. *Creative Activities and Curriculum for Young Children*. Boston: Cengage Learning, 2014.	Creativity.	The first chapter shortly discusses what creativity is, thinking processes involved and how to encourage creativity in students.	Educational Science
McComas, William F. "21st-century skills." In *The language of science education*, pp. 1 – 1. SensePublishers, 2014.	21st century skills.	Summary on the developments in the field of 21st century skills up until 2014.	Educational Science
Megill, Allan. "'Big History' Old and New: Presuppositions, Limits, Alternatives." *Journal of The Philosophy of History* 9 (2015), 306 – 326.	The International Big History Association; Bill Gates; Creation Myth.	Describes the institutionalising aspects of Big History that helped the discipline develop. Creation Myths aren't suitable in history	History
Naaijer, Janita. "Rondvraag: hoe houdbaar is het advies	Onderwijs2032; Sander Dekker.	Column in the Volkskrant about the various opinions on	Philosophy

Ons Onderwijs 2032?" *Volkskrant*, April 12, 2016. Accessed October 13, 2016. http://www.volkskrant.nl/opinie/rondvraag-hoe-houdbaar-is-het-advies-ons-onderwijs-2032~a4280185/		*Platform Onderwijs2032*, out of which State Secretary, Sander Dekker.	
Phillips, D. C. and Siegel, Harvey. "Philosophy of Education." In *The Stanford Encyclopedia of Philosophy* (Winter 2015 Edition), edited by Edward N. Zalta. Accessed September 21, 2016. http://plato.stanford.edu/archives/win2015/entries/education-philosophy/.	Philosophy of education; Dewey; Progressivism; Jean-Jacques Rousseau.	Discusses the relevance as well as theories among educational philosophers. Of particular importance, is the discussion of Dewey's philosophy of education.	Philosophy
Platform Onderwijs2032. *Ons Onderwijs 2032: Eindadvies.* Den Haag, 2016. Accessed September 10, 2016. http://onsonderwijs2032.nl/wp-content/uploads/2016/01/Ons-Onderwijs2032-Eindadvies-januari-2016.pdf.	Modernization; Future-oriented education.	Description of the vision of the Dutch government on modernization of the educational system.	Philosophy Educational Science
Repko, Allen F. *Interdisciplinary Research: Process and Theory.* 2d ed. Los Angeles: SAGE, 2008.	Sub discipline; Interdisciplinarity.	Provided the definition of 'sub discipline' and interdisciplinarity. Handbook on doing interdisciplinary research. Relevant skills to interdisciplinary thinking and working.	History Philosophy Educational Science
Schäfer, Wolf. "Big History, the Whole Story, and Nothing Less?" *Canadian Journal of History* (autumn 2006), 317 – 328.	Big History.	Explains the nature of Big History. Argues that the book *Maps of Time* gives too much attention to human history.	History
Shier, Harry. "Pathways to Participation: Openings, Opportunities and Obligations." *Children & Society* 2 (2001), 107 – 117.	Collaboration.	Expressing one's opinion by children has to be encouraged and the opinions have to be taken into consideration by others in the decision process,	Educational Science

		facilitating participation and feeling responsible.	
Simon, Richard B. "What is Big History?" In *Teaching Big History*, 11-20 California: University of California Press, 2015.	Big History.	Description of Big History on an educational level, directed at university teachers.	Educational Science
Spelt, Elisabeth JH, Harm JA Biemans, Hilde Tobi, Pieternel A. Luning, and Martin Mulder. "Teaching and Learning in Interdisciplinary Higher Education: A Systematic Review." *Educational Psychology Review* 4 (2009), 365 – 378.	Interdisciplinarity.	Overview of aspects important in interdisciplinary education, including relevant skills.	Educational Science
Tosh, John. *The Pursuit of History*. 5d ed. Great Britain: Pearson, 2010.	The uses of history; Historical relevance and ideology.	Historians should contribute to the scholarly debate instead of serving a particular ideology. History should not be based solely on metahistory but it should also not be totally focussed on the practical purpose, i.e. it must be balanced. Sometimes, however, the uses of history can be pursued, because of the critical scrutiny of other historians.	History
Trilling, Bernie, and Charles Fadel. *21st Century Skills: Learning for Life in Our Times*. San Francisco: John Wiley & Sons, 2009.	21st century skills.	Sorted 21st century skills in three categories: learning and innovation, digital literacy and career and life. Describes collaboration and creativity in the first category.	Educational Science
Turnbull, Paul. "The Aims of Big History." *History Compass* 7 (2015), 349 – 358.	Universal History.	Universal History is criticized by 'regular' historians. Discusses the inconvenience of positioning of Big History as a form of Universal History.	History

Vincent, Shirley, and Will Focht. "Interdisciplinary Environmental Education: Elements of Field Identity and Curriculum Design." *Journal of Environmental Studies and Sciences* 1 (2011), 14 – 35.	Interdisciplinarity.	Study on acquiring skills in interdisciplinary education. Argues that creativity is very important for problem solving.	Educational Science
Woolfolk, Anita, Malcolm Hughes and Vivienne Walkup. *Psychology in Education.* England: Pearson Education Limited, 2013.	Creativity; Collaboration.	Describes the basic principles for encouraging creativity in children at school as well as how important collaboration is to learning.	Educational Science
Zoellick, Erin M. "Philosophical Orientation to Adult Learning: A Descriptive Study of Minnesota Environmental Education Practitioners." Master's thesis, University of Minnesota Duluth, 2009. 1 – 92. Accessed November 17, 2016, https://d-commons.d.umn.edu/bitstream/10792/131/1/Zoellick,%20Erin.pdf.	Progressivism.	This master thesis offered information regarding the five fundamental characteristics of educational philosophies.	Philosophy
"Big History Project FAQ 2014-15." Big History Project. 1-5. Accessed November 11, 2016. https://www.bighistoryproject.com/media/bhp-assets/BHP-FAQ-2014.pdf.	Big History; Goals of Big History.	Describes the goals, targets, origins and potential Big History courses.	Philosophy

Appendix 2: Interview with Constance van Hall and Joris Burmeister

Op 24 oktober 2016 heeft dit explorerende interview plaatsgevonden op het A. Roland Holst College te Hilversum. Maureen de Boer en Sanette van Noord hebben hier afgesproken met Constance van Hall en Joris Burmeister, twee docenten van het vak Big History. Constance van Hall is de auteur van het boek *Big History een vakoverschrijdende oriëntatie op de wetenschappen*, de eerste Nederlandse lesmethode voor het schoolvak Big History. Samen met haar collega Joris Burmeister heeft van Hall Big History in Nederland geïntroduceerd.

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Sanette: We hebben ook aan de leerlingen daarnet even uitgelegd wat wij doen. Voor jullie hebben we eerst gewoon een paar algemene vragen, ook een beetje uit eigen interesse. Daarna heb ik dan nog aparte vragen voor mijn stuk. Ik heb het boek gebruikt en daar hoort natuurlijk nog wat bij.

Maureen: Ik ga een historisch onderzoek doen. Ik vind het wel moeilijk om van Big History een historisch onderzoek te maken. In eerste instantie wilde ik onderzoeken hoe Big History wordt gepositioneerd in het historiografisch debat.

> **Van Hall:** Wordt het überhaupt gepositioneerd?

Maureen: Blijkbaar wel. David Christian heeft een paper geschreven en hij zegt heel sterk dat Big History lijkt op een terug keer naar universal history, hele uitgebreide geschiedenis. Maar van onze begeleider mag ik Big History helemaal niet vergelijk met geschiedenis.

> **Van Hall:** Ja, het gaat wel verder dan dat. Het is wel geschiedenis maar niet als discipline. Het is anders, het is interdisciplinairder. Maar het zijn wel vaak historici die het geven. David Christian is natuurlijk zelf ook een historicus die dat is gaan geven in Sydney ooit. Dus het is niet zo raar dat het vanuit geschiedenis komt. Hij zegt ik moet gewoon altijd meer vragen stellen, daardoor werd de geschiedenis steeds groter. Hij bestudeerde bijvoorbeeld drinkgedrag van Russen en eindigde bij de Big Bang zeg maar.

> **Burmeister:** Hij is Ruslandkundige en op zich had hij al een gedurfde these, een hele brede these. Zoals wij dat ook op de open dag brengen, we zeggen dat Big History een beetje terug naar de oude Bildung is, uit de negentiende eeuw.

Maureen: Ja, daar ben ik mee bezig!

> **Burmeister:** Op die manier kun je het plaatsen. Het grote proces is dat je tot en met de negentiende eeuw werd men steeds breder. Daarna begon die specialisatie, die ook heel erg nodig was natuurlijk.

> **Van Hall:** Dit is daar eigenlijk weer een antithese op. Iedereen is zo gespecialiseerd en zit zo in z'n eigen vakgebied dat die grote lijnen niet meer zichtbaar zijn en nu zie je dat er dit soort vakken komen om juist weer de ogen te openen van hoe past dat wat ik doe, dat kleine stukje, in dat grotere verhaal. Daardoor krijg je meer uitwisseling en een student ook niet clueless op de universiteit rondloopt en alles van zijn vakgebied weet. Maar ook weet wat er aan die faculteit allemaal gebeurd, waar is iedereen mee bezig. Wat zijn de grote vragen? Dat is wat het doet. En dat was ook het ideaal van Bildung vroeger, dat je veel breder geschoold was. Tegenwoordig op scholen is het zo gespecialiseerd, Je gaat van vak naar vak, hap snap, heel gedetailleerd, allemaal leuk, maar dat grote verhaal dat mist een beetje.

Burmeister: Op school doen wij het ook bewust die bovenbouwleerlingen,die uitgezwermd zijn over de profielen, bij elkaar zetten. Ze hebben een profiel gekozen maar hier zitten ze bewust bij elkaar. Dat hebben we bewust zo gedaan. Het is voor iedereen een verplicht vak. Het niveau in Nederland daalt een beetje. Mensen shoppen maar met argumenten. Het niveau van het publieke debat gaat naar beneden. Ik denk eigenlijk dat je met dit vak de leerlingen meer bij brengt. Inhoudelijk maar ook met vaardigheden. Bij de voorbereidingen op het Geschiedenis en filosofie examen gebruiken wij vaardigheden uit Big History, want het zijn universele vaardigheden. Het wegen van bronnen is even anders, je hebt de structuur bij geschiedenis en die ik helemaal prima maar… Ik had vorig jaar bijvoorbeeld een havo 5 klas die had moeite met het examen, ze hadden geen Big History gehad. Ik heb die claimtesters gedaan in de hoop dat het examen mee zou vallen. We hopen dat met de inhoud en vaardigheden het niveau weer een beetje terug komt.

Van Hall: Voor zover er een niveau was natuurlijk. Vroeger was het onderwijs natuurlijk helemaal hap snap. Maar zo kun je wel positioneren. Vooral Bildung is ideaal, voor de historische visie heel erg leuk!

Maureen: Ik ben daar wel meer bezig geweest. Ik wilde Big History en Bildung met elkaar vergelijken. Dat heeft dan te maken met destijds de Bildung en nu dan het plan onderwijs2032, want dat is het grotere idee achter ons onderzoek. Dus ik had wel verwacht dat dat zou kunnen, dus het is fijn om te horen dat dat ook zo kan.

Van Hall: Ja, ik zou het zeker goedkeuren. Ik zou dat heel interessant vinden om te lezen zelf. In hoeverre Big History eigenlijk een heropleving is van het Bildungsideaal, dat is een mooie vraag. Maar ik mag dat natuurlijk niet bepalen.

Maureen: Ik vroeg me af in hoeverre het schoolvak Big History verschilt van de Big History van David Christian. Ik weet niet of het in een bepaalde vorm gegoten is bijvoorbeeld.

Van Hall: Iedereen kan het in zijn eigen vorm gieten. Waar wij onszelf heel erg aan committeren is hoe het is vormgegeven voor High Schools in de Verenigde Staten, de course website. David Christian heeft het eigenlijk op drie niveaus gegeven. Niveau 1 is universitair niveau, daar zijn ook hele mooie filmpje van. Dat gaat nog veel dieper. Dat is gewoon wat je op de universiteit aan Big History krijgt. Niveau 2 is de middelbare school en daarin staan die acht drempels echt centraal. Thema's als claimtesters en goldilocks conditions, complexity. Daar kijk je elke keer naar. Dat zijn hele mooie zaken, waardoor je vanuit dat oogpunt een heel mooi verhaal krijgt. Daar houden wij ons heel erg aan vast. En je hebt natuurlijk ook nog voor het grote publiek de uitgeklede course website, waar je een beetje die acht drempels krijgt en het grote verhaal, maar met minder eisen. Drie niveaus. En wij vinden zelf, maar dat mag iedere school zelf bepalen, daar zijn geen richtlijnen voor, elke school kan het zijn eigen invulling geven, maar wij vinden het belangrijk dat die acht drempels alle acht aan bod komen, zodat je niet een paar wel en een paar niet behandeld. Dat zou echt afdoen aan het grote verhaal, dan is de hele magie en kracht weg. En ik vind ook heel belangrijk dat je telkens die claimtesters bijvoorbeeld terug laat komen. Maar nogmaals iedere school mag dat zelf bepalen omdat er geen richtlijnen zijn. Dus je kunt zeggen wij zijn een Big History school, terwijl je eigenlijk amper Big History geeft en veel te specialistisch werkt, zonder het grote verhaal in kaart te brengen. Dan stoppen ze bijvoorbeeld bij drempel vier. Dat kan gebeuren en dat weten we dus niet. We zijn daar wel mee bezig, samen met de UvA, om te kijken en te coachen bij scholen.

Kijken wat er precies allemaal gebeurd. Maar de meeste gebruiken wel de kracht hiervan, de course website. Dat boek is ook een kleine poging daartoe. Er was heel veel vraag van docenten om iets om op terug te vallen te hebben. Dus we hadden heel veel geluk dat die uitgever eraan wilde. Het is ook niet commercieel bedoeld. We steunen iedere school, of ze nou het boek gebruiken of niet. Er was heel veel vraag naar en het helpt docenten om die acht drempels echt door te werken. De kracht ligt in de combinatie. Die course website is waar ook het boek op is gebaseerd. Niet alles natuurlijk want het is een enorme hoeveelheid aan informatie. Het is een selectie en daarna wordt het steeds meer. Vorig jaar zijn we begonnen met de investigations die erop staan. Daarvoor was het echt watertrappelen. Dan probeer je dit er doorheen te krijgen en op een gegeven moment ga je zwemmen en spelen. Maar het is zo veel dat je altijd keuze moet maken.

Burmeister: Hoe Big History moet worden gebracht verschilt ook tussen scholen.

*Maureen***:** *Gelovige scholen?*

Van Hall: Ja, maar die brengen het dan gewoon net anders. Die zeggen niet Big Bang, maar het verhaal begint… Om ouders niet te shockeren.

Burmeister: Ze leggen dan ook minder nadruk op die drempels.

Maureen: Is het doel van het vak op zich wel overal hetzelfde? Ik heb het eerste hoofdstuk van het boek gelezen en daaruit kon ik vooral halen dat het echt is om fragmentatie tegen te gaan en verbinden. Dat staat ook in het plan 2032. Maar aan de andere kant zie ik ook veel over burgerschap.

Van Hall: Ja, dit is dan Wereldburgerschap. Dat is zo mooi. Maatschappijleer, filosofie en geschiedenis doen al veel aan burgerschap. Dat vind ik, ook bij 2032, heel beperkt aangepakt. "Hoe kan je deelnemen aan het democratisch proces" Nou ik vind dat leuk maar dat weten ze nou wel. Dit is echt wereldburgerschap. Van wauw, moet je eens kijken wat ons allemaal verbind, om alle conditions te bekijken die ervoor gezorgd hebben dat we hier zijn. En hoe kwetsbaar onze aarde ook is. Dat is ook echt de eindboodschap. Daar gaat het laatste filmpje op de course website ook over. Daar zie je echt die mooie eindboodschap van Big History, dat wereldburgerschap. Er is zoveel meer wat ons samen bind dan wat ons verschillend maakt. En dat we heel blij moeten zijn met deze aarde en dat we er heel zuinig op moeten zijn en voorzichtig. Ik vind het mooi dat dit nou juist weer met een andere invalshoek, op een andere schaal, kijkt naar burgerschap. Dat vind ik heel sterk. Anders gaan al die vakken hetzelfde doen. Burgerschap bij maatschappijleer is natuurlijk goed en leuk maar ook wel heel erg beperkt.

Maureen: Bij David Christian kwam dat wereldburgerschap ook heel erg terug. Toen keek ik naar dat plan en dat vond ik eigenlijk meer nationaal gericht. Daar vond ik wat frictie. Een van de eerste artikelen die ik vond over Big History ging over fundamentalism. Dus ik dacht hoe staat dat in relatie tot Big History? Hoe Big History kan bijdragen aan een meer wereldse mentaliteit en wat dat allemaal kan voorkomen. Daarom vroeg ik me ook af of het in dit vak ook zo meer op de wereld was gericht, in plaats van nationaal.

Van Hall: Ja heel erg. Je kijkt echt op wereldniveau, echt op een andere schaal. Je kijkt eerst op universum niveau zelfs. Maar je kijkt ook niet naar een land maar naar de mensheid, van wat heeft het voor de mensheid gebracht, dat het landbouw ging bedrijven, en de moderne revolutie. Dat is een hele andere schaal dan bij geschiedenis. Daar kijk je op nationale schaal. Dat gaat heel erg over de geschiedenis van Europa en

op een gegeven moment alleen maar Nederland en een beetje over Frankrijk en Engeland, maar dat is alles. Dit is totaal niet zo. World History zit in drempels 7 en 8 maar het is echt een andere schaal waarop je kijkt dus.\

Burmeister: Belangrijk zijn ook die andere schalen als bepalende factor. Iedereen heeft al die vakken. En leerlingen moeten ook niet het gevoel hebben van: 'hé dit is dubbel'. Dan hebben we het over de landbouwrevolutie bij geschiedenis, maar hier hebben we het over Europa, Amerika en Azië en dan kijken we wat daar gebeurde en dan bekijk je: 'is dit een beslissende stap geweest in de voorsprong van Europa?' Bijvoorbeeld. Je kijkt echt op mondiaal niveau. Dat is voor de leerlingen de toegevoegde waarde en dat is ook de toegevoegde waarde van het vak.

Van Hall: Je kijkt echt naar het waarom. Wat zijn de ingrediënten? Wat zijn de conditions waardoor dit gebeurde.

Burmeister: Dan kijk je bijvoorbeeld ook naar het klimaat, ziekten, het weer, heel breed. Mondiaal, interdisciplinair. Ik heb het gevoel dat de leerlingen nooit voelen dat het dubbel is, het is toegevoegde waarde.

Maureen: De leerlingen gaven ook niet aan dat ze vonden dat het dubbel was, ook al hebben ze pas een paar lessen gehad. Ik vroeg waar ze het meer op vonden lijken, op geschiedenis of op natuurkunde. Toen zeiden ze dat het meer de geschiedenis van de wetenschap is. Dat vonden we wel een mooie.

Van Hall: Ja, het is wel erg dat we wetenschap in de brede zin van het woord een geschiedenis daarvan geven ook.

Maureen: Ik heb aan anderen ook gevraagd, waarom zij vonden dat Big History niet als geschiedenis kan worden gezien.

Burmeister: Wat zou je nu dan zelf antwoorden? Nu je dit hebt gehoord.

Maureen: Ik zou zeggen dat het anders is dan geschiedenis omdat de methoden verschillen, omdat het interdisciplinair is, doordat het gebruik maakt van verschillende disciplines.

Van Hall: En ik denk, dat je vooral op een hele andere schaal kijkt dan bij geschiedenis. Dat is heel bepalend.

Maureen: Ik zou het zelf dan nog wel geschiedenis durven noemen, want binnen de geschiedenis heb je ook universal history. Je hebt verschillende specialisaties.

Van Hall: Je hebt ook World History, dat is ook heel populair maar dan begin je toch bij drempel 6, de rest daar voor niet. Big History gaat echt nog verder dan universal of world history, het begint echt bij het begin. En dan maakt het anders. De universe skill is er niet, vanaf world skill wel, en Big history heeft dat allemaal en dat maakt het zo krachtig. Doordat je daardoor echt alle disciplines betrekt.

Maureen: Ik was vooral benieuwd hoe jullie er tegen aan keken. En ik vroeg me ook nog af of er ook vanuit Nederland gepubliceerd wordt over Big History.

Van Hall: Nee nog niet. Als je al publiceert over Big History dan doe je dat internationaal, draag je bij. Fred Spier is hier natuurlijk heel groot en die publiceert ook boeken en papers enzo. Esther Quaedackers heeft iets met Little Big History gedaan. Er is wel wat maar niet zoals effect op school etc. Dat moet echt nog komen. Maar er zijn wel heel veel zaken die in Amerika die onderzocht zijn die een op een te vertalen zijn met de Nederlandse vertaling als je uitgaat van de course website en het

zo geeft zoals het bedoeld is. Welke consequenties heeft dat op het schrijven van leerlingen door investigations enzo. Er is wel veel onderzoek maar alleen in Amerika.

Burmeister: Maar dat gaat nog wel komen.

Maureen: Zou het ook als vak kunnen worden ingesteld in Nederland?

Van Hall: Jazeker! Het is al op 42 scholen. Het is nu een vak in plaats van ANW, daarin kun je het laten tellen en dan telt het ook mee voor het combinatiecijfer. Soms wordt het ook gegeven als een extra vak voor je vorming. Wij geven diploma's, dat vinden de leerlingen heel leuk, en dat is een extraatje voor sommige universiteiten om daar aangenomen te worden. Het is dus al op 42 scholen dus blijkbaar is er wel animo.

Burmeister: Ik heb een keer een leerlinge begeleid die naar een speciale Engelstalige opleiding wilde en die heeft vanuit Big History toen een heel goed stuk geschreven en werd daarop ook aangenomen.

Van Hall: Het is bij veel universiteiten inmiddels een plus. Dat is wel leuk.

Maureen: Er is geen bepaalde opleiding voor, toch, om Big History docent te worden?

Van Hall: Nee inderdaad en dat willen we zo graag! Het is nu zo je moet de durf hebben en ik denk wel dat je bevoegd docent moet zijn. Je moet al op een school werken en dan moet je gevraagd worden of zelf vragen van of Big History misschien iets is. Ik denk dat het belangrijk is om eerste graads bevoegd te zijn, omdat je dan ervaring hebt met wetenschap en vaak zelf ook op de universiteit hebt rondgelopen. Je hebt in het onderwijs eerste graads en tweede graads. Tweede graads is eigenlijk iemand die een HBO studie heeft gedaan en dan mag je alleen onderbouw geven en eerste graads dan mag je ook bovenbouw geven. Dan heb je zelf ook vaak universiteit gedaan, hoewel je tegenwoordig ook via het HBO een master kan doen, maar in principe zijn dat wel handige dingen om mee te hebben. Eerste graads bevoegd zijn, zodat je dat enthousiasme voor wetenschap ook uit kunt stralen.

Burmeister: Bij heel veel studies is geschiedfilosofie, historiografie ook een onderdeel van de studie en daar leer je al een beetje wat breder kijken. Ik denk dat die academische graad wel belangrijk is.

Van Hall: Dit is alleen maar een opinie hé. In principe zijn er nu geen eisen, geen criteria. Wij hebben wel eisen omdat wij het als ANW combinatiecijfer tellen, dus dan moet je aan de eisen van ANW voldoen. Dat lukt makkelijk en daar maken we ons ook helemaal geen zorgen over. Er zijn ook scholen die het niet in het combinatiecijfer doen, dan kan je geven wat je wilt natuurlijk. Daarom is het wel belangrijk dat er wat geprofessionaliseerd wordt. En dat we ook in Amerika gaan vragen, hoe zij dat daar doen om te garanderen dat het op de goede manier aangeboden wordt. Het is moeilijk.

Maureen: Wel apart dat je als Liberal Arts & Sciences student, ze binnen geschiedenis vaak niet willen dat je de educatieve master gaat doen dan. Omdat je dan niet past in het schoolvak geschiedenis.

Van Hall: Je kunt dan nog een pre-master doen misschien. Maar echt vervelend zeg, juist die breed geschoolde historici zou je willen.

Maureen: Interdisciplinariteit in het onderwijs vind ik echt goed. Zag in het boek dat je ook een 'echt paper' moet schrijven aan het eind.

Van Hall: Ja dat paper schrijven enzo, zijn we ook veel meer aan het uitbouwen, zodat dat het later op de universiteit ook veel makkelijker gaat. Ik denk dat er juist veel behoefte gaat komen aan breedgeschoolde mensen. Op een gegeven moment krijg je gewoon vacatures Big History docenten, maar wat de school vindt dat jij aan vooropleiding moet hebben. Maar ik denk sowieso een eerste graads bevoegdheid. Vaak is het ook naast een ander vak. Joris geeft hiernaast nog geschiedenis en ik hiernaast ook filosofie. Maar ik weet niet in hoeverre het nog gaat veranderen natuurlijk.

Burmeister: Dat hangt heel erg af van de positionering.

Sanette: Ik ga als sociaal wetenschapper wat meer vragen over het leren stellen, dan over de inhoud. Ik vroeg me af wat de voorkennis is van jullie leerlingen als ze hier binnen komen. Waar ga je vanuit?

Van Hall: Nou ik heb geen hele lijsten. Ze zijn vwo 4 dus hebben de basis stof van vwo 1-3 gehad, bij ons. Maar er zijn bijvoorbeeld ook scholen die het geven in vwo 1 en die gebruiken dus ook niet mijn boek maar een eigen syllabus. Dan is het niveau 'teken een planeet', heel schattig, maar dat is natuurlijk een heel ander niveau. Wij gaan er vanuit dat we vwo 1-3 hebben gedaan en dat dat voorkennis is en dat ze dat begripsniveau hebben om nieuwe dingen te gaan leren en begrijpen.

Sanette: En op het wetenschapsoriëntatie vlak dan?

Burmeister: Het komt terug maar het is niet verplicht.

Van Hall: Wij hebben hier op school wetenschapsoriëntatie als vak in vwo 1, 2 en 3. Maar er komen ook mensen uit Quest. Dat is iets anders, een havo vwo brugklas. Die hebben geen wetenschapsoriëntatie en die krijgen op een hele andere manier les, zelf onderzoekend leren. Uiteindelijk komen ze in 4 vwo allemaal bij elkaar, de ene helft heeft dan wel wetenschapsoriëntatie gehad en de andere helft niet. En we beginnen hier dan opnieuw. Voor sommigen is het heel veel herhaling, die hebben al eens van paradigma's en hypothesen gehoord en al verslagen geschreven. Voor anderen is het nieuw en daarom herhalen we alles. Voor anderen is het een goede herhaling. Wetenschapsoriëntatie is heel speels en leuk. In de vierde wordt het herhaald om te zorgen dat iedereen op hetzelfde niveau is. Maar dat is op onze school. Er zijn ook andere scholen die geen wetenschapsoriëntatie hebben. Ik hoop dat ik het boek ook zo heb geschreven dat je die kennis ook niet nodig hebt om het in de vierde te begrijpen. En tot nu toe heb ik daar nog geen berichten over gehoord, dat het te moeilijk zou zijn of iets dergelijks. Natuurlijk kun je als docent bepalen wat je wel en niet behandeld en eventueel te moeilijk vindt. Wij zijn misschien gek dat wij quantum mechanica uitleggen aan 4 vwo'ers maar dat is gewoon super stoer dat ze daar iets vanaf weten. De course website heeft daar helemaal niks over, dat hebben wij ingevuld. Dit zijn dingen die wel veel terug komen op internet, met Schrodinger's cat. Maar ook niet komst van een quantum computer. Het is gewoon leuk om dan de basics te begrijpen. Maar dat is het leuke van docent zijn natuurlijk.

Burmeister: Het mooie is dat je als het ware kan zappen door de tijd.

…

Van Hall: Het is belangrijk dat de scholen die het vak ook geven zich aan die drempel houden, en die claimtesters zijn echt heel belangrijk. Verder is het best vrij.

Sanette: (korte uitleg onderzoek)

Van Hall: Ik denk dat ik je dan het best onze Little Big History opdracht kan sturen. Dat is heel erg out of the box, je moet heel rare connecties leggen. Je moet de hele tijd skillswitchen. We doen dat in de vijfde nu nog omdat er in de vierde daar geen tijd voor is. In de vijfde is het de basis voor een paper. Dat kan ik je wel even sturen, want dat is precies dat divergent denken. Ik neem aan dat je wel de Ted Talk hebt gezien over 'How education kills creativity', daar zit het ook in. Dat proberen we terug te krijgen met die Little Big History opdracht, maar ook in de lessen in de zin van dat we altijd benadrukken dat die grote denkers zelf ook out of the box denkers waren, want zij gingen heel anders denken. Dat geven we als voorbeeld en vervolgens willen we proberen ze zelf eraan te zetten, maar dat is wel moeilijk natuurlijk. Maar die opdrachten van de course website zorgen daar wel voor. Dat skillswitchen zorgt voor hele spectaculaire vragen die je anders niet had gesteld en dat helpt wel. Dus het geeft wel vaardigheden om dat te krijgen.

… (Joris Burmeister vertrekt)

Van Hall: In het boek van Big History staat het nog niet want dat hebben we zelf bedacht. Het is weer nieuw maar het werkt wel goed denk ik.

Sanette: Little Big History waar komt dat vandaan?

Van Hall: Dat is van Esther Quaedackers van de UvA die heeft het dan op de UVA gedaan. En wij hebben dat nu een beetje vertaald naar de middelbare school. Ze doen daar ook op de website wel wat mee, maar dat vind ik niet goed uitgewerkt dus ik ga proberen het daar met mensen nog over te hebben. Wij hebben dat zelf dus gemaakt en vorig jaar voor het eerst gedaan en het was erg leuk. De leerlingen moesten hele rare links leggen maar dat werkt wel goed.

Sanette: Worden er nog meer projecten gedaan in dit vak?

Van Hall: Ja heel wat. Bij drempel 6 laten we ze zelf een experiment opzetten om sociaal gedrag te onderzoeken, van de sociale psychologie. Dan wordt Hilversum onveilig gemaakt, dan gaan ze op straat liggen en kijken hoe ze reageren enzo. We proberen ze wel een origineel experiment op te laten zetten. Om te laten zien hoe creatief je moet zijn in de sociale wetenschappen,. Je moet het stiekem doen, ze moeten het niet door hebben dat je ze filmt, ze moeten niet door hebben waar het over gaat. Je moet onder het mom van dat en dat iets doen. Dat is wel leuk, dat ze zich dat ook wel een beetje beseffen. Daar zijn we ook wel heel trots op, die opdracht. Die kan ik je ook nog sturen.

Sanette: Heel graag.

Van Hall: We hebben ook nog een reader gemaakt. Dat zijn gewoon allerlei dingen van de course website. Invulvragen, skills worksheets, die vind ik heel sterk. Dat soort zaken. Dan zijn ze ook creatief aan de slag. Dus daar werken ze ook mee en dat is allemaal van de course website. Er is echt belachelijk veel, je moet echt keuzes maken.

Sanette: Werken ze ook samen in groepen?

Van Hall: Bij dat psychologisch experiment wel. Andere dingen doen ze wel alleen, bijvoorbeeld dat Little Big History project. Dat ze zelf helemaal een paper kunnen

schrijven, daarop los gaan, het helemaal op hun eigen manier benaderen. Investigations, soort essays, schrijven ze ook zelf. Ik vind het heel belangrijk dat ze goed leren schrijven en durven te schrijven en durven links te leggen. Ik vind dat er al zo veel in groepjes moet. Dat vind ik soms de boel terug houden. Het is leuk als ze nou gewoon eens dingen zelf kunnen. Het profielwerkstuk moet bijvoorbeeld ook al weer in groepjes, dus dan vind ik het wel goed dat er ook wat individuele opdrachten zijn.

Sanette: Ik heb wel natuurlijk samenwerken als vaardigheid genomen omdat het in interdisciplinair werk veel terug komt. Zoals wij nu ook dus een scriptie samen schrijven.

Van Hall: Dat is bij onze profielwerkstukken dus ook zo. De NT'er pakt de biologische hoek en de EM'er pakt de psychologische hoek en dan schrijven ze samen een stuk. We merken wel dat sinds wel Big History geven we ook wat interessantere onderwerpen krijgen, wat bredere en mooiere vragen. Iets creatiever ook.

Maureen: Dus voor het profielwerkstuk moeten ze van verschillende profielen zijn?

Van Hall: Ja, en ze moeten een voorwoord erbij schrijven over bij welke drempel van Big History hun onderzoek het beste past. We proberen ze echt te stimuleren om iets verder te denken. Dat ligt wel heel erg aan de begeleider van het vak want Joris en ik doen dat omdat wij Big History geven. Beta docenten denken veel specialistischer, dan wordt het minder gestimuleerd. Het ligt dus een beetje aan de docent.

Sanette: Ik heb voor de vaardigheid samenwerken de beschrijving uit onderwijs2032 genomen, omdat er in de literatuur zo enorm veel keuze was. Dus ik heb op die manier het volgende geselecteerd: eigen mening kunnen geven, kritiek kunnen ontvangen en verantwoordelijkheidsgevoel in de groep. Ik heb de opdrachten ook geanalyseerd en er wordt best vaak gevraagd naar een eigen mening. Ik vroeg me af of die opdrachten dan ook besproken worden in de klas.

Van Hall: Ja soms wel. Maar we hebben maar 1 uur in de week. We hebben wat minder tijd ervoor, maar we doen het dan stiekem bij Filosofie wel. We vragen wel heel vaak meningen in de klas. We vragen ze kritisch te kijken welke claimtesters er zijn en of je dat voldoende vindt. Vindt jij dat er genoeg evidence is of voldoende logic. Of is het puur omdat wij het zeggen? Het is wel heel belangrijk dat ze ook kritisch kijken. Dat ze denken van leuk dit allemaal maar neem ik dit zomaar aan. Ga ik niet verder op zoek. Dat stimuleer je heel erg, dat kritisch denken. Dat is ook waar de course website heel erg op in zet. Dat je dat elke keer formuleert. Ik denk dat dat ook wel erg leuk is. Je leert beter onderbouwen met die claimtester maar ook met je kennis. Je kan pas je mening geven als je een beetje de basics weet en weet hoe het allemaal samenhangt. Skillswitchen helpt daar ook wel mee. Dan kan je heel makkelijk perspectief switchen en kan je beter begrijpen waarom iemand met die en die achtergrond zo en zo reageert. Dat komt dan vanzelf impliciet aan de orde.

Sanette: Hoe worden die groepen dan vervolgens begeleid? Bij die opdracht met dat sociaal experiment.

Van Hall: We hebben gewoon een heel goed uitgewerkte opdracht met allemaal stappen en dat moeten ze gewoon doen en dan vragen we af en toe hoe het gaat. Maar verder geen begeleiding, nee. Hetzelfde als op de universiteit, gewoon de opdracht om een paper te schrijven. Wel een beetje begeleiding. We laten ze eerst veel voorbeelden zien en vertellen heel veel over sociaal gedrag van mensen dan dagen we ze uit dat nou zelf ook eens te onderzoeken en ervaren. Daar komen dan vaak hilarische video's

uit. Heel leuk. Drempel 1 en drempel 6 worden altijd het hoogst gewaardeerd. 1 vanwege de coole onderwerpen als quantum mechanica.

Sanette: Dan is er nog het omgaan met kritiek van elkaar.

Van Hall: Je bedoelt peer feedback? Ja dat zit in Big History wel heel veel, maar daar hebben we helaas niet altijd de tijd voor. Er zijn hele mooie rubrics om elkaars papers mee te beoordelen. Het zit nu in de onderbouw wel maar we hebben er hier gewoon geen tijd voor. We willen het wel implementeren maar dat is er niet van gekomen, omdat we maar 1 uurtje in de week hebben. Maar 25 lessen in het jaar om die hele geschiedenis te doen. We beginnen met 30 lessen maar dan worden er toch dingen in elkaar geschoven omdat er lessen uitvallen etc. Peer review is er nog te weinig. Maar bij de investigations worden leerlingen wel gevraagd het te vergelijken met een ander en daar dan een reflectie over te schrijven. Dat doen sommigen want dat is nog niet helemaal goed gestimuleerd. We willen dat wel meer doen. Kritiek geven en ontvangen, leren we impliciet. Als je je claim niet goed met claimtesters onderbouwt, dan kan je kritiek verwachten. Dat is weer een andere vorm van kritiek. Leren door te doen en ervaren. Anders dan peer review.

Sanette: Uit eigen interesse vroeg ik me nog af hoe je die integratie van al die disciplines bewerkstelligd. Hoe je zorgt dat ze de rode draad wel kunnen volgen.

Van Hall: Ja dat doen dus die acht drempels. Daardoor weet je precies waar je bent, waar je in het verhaal zit. Zonder die drempels kunnen wij niet. Fred Spier is er heel erg op tegen. Eigenlijk heeft hij op dat gebied echt bijna ruzie met David Christian. Fred Spier vindt die drempels helemaal niks. Ik denk dat je zonder die drempels helemaal verloren bent in het verhaal. Ik vind dat ze de hele tijd goed zijn onderbouwd met die conditions en complexiteit. David Christian is meer historicus en Fred Spier is echt een beta, en die wil daar dan evidence hebben en meetbaarheid. En die drempels zijn natuurlijk niet te meten. Dat is hun grote clash, wetenschappelijk dan. Ik vind die drempels de rode lijn en de kracht van het vak. Als je je daar niet aan houdt dan is de lijn heel snel weg voor iedereen. Je kunt het niet plotseling over het ontstaan van sterren gaan hebben als je niet snapt hoe dat in die drempels zit. Die maken het zo veel makkelijker. Het is een chronologie van complexiteit. Het lijkt zelfs een beetje op de tijdvakken bij geschiedenis, dat hadden ze in mijn tijd niet. Dat is een tendens. Bij geschiedenis is het dan wel dat een tijdvak begint en eindigt. Bij Big History is alles tegelijkertijd nog bezig.

Maureen: David Christian en Fred Spier en nog een andere auteur, die ik me nu even niet kan herinneren, hadden het ook over energy.

Van Hall: Dat is ook een thema in Big History, energy toename enzo. Zit meer bij Fred Spier, die is meer van energy. Maar David Christian heeft het ook overgenomen.

Maureen: De auteurs verschillen onderling van hoe ze Big History definiëren.

Van Hall: Op het middelbare school niveau is die discussie minder want dit werkt gewoon ontzettend goed en iedereen gebruikt wel gewoon die course website en de acht drempels. Die maken het voor studenten heel makkelijk. Je kunt daarna de nuances wel leggen. Als je zelf meer beta bent en evidence based meer wilt werken, dat is moeilijk. Daar kun je het debat wel aangaan.

Maureen: Een van de kritieken die ik tegen kwam, was een vrouw die vond dat in de wetenschap er niet echt een lijn valt te trekken omdat iedereen die over Big History schrijft het net weer anders aanpakt.

Van Hall: Het mooie van Big History is wel dat we de disciplines op een lijn krijgen. Binnen een discipline kun je prima een debat hebben, maar als je erbuiten gaat, zoals bij LAS, dan zijn er veel te veel verschillen. Big History probeert met grote concepten die disciplines met elkaar in debat te laten gaan. Dat biedt ook oplossingen.

Maureen: En die drempels zijn dan misschien een integratiemiddel, zoals je dat doet in een interdisciplinair onderzoek.

Van Hall: Ja inderdaad en ook die grote concepten zoals toename van complexiteit, energy, dat soort dingen. Als je maar goed uitlegt wat je eronder verstaat. Big History probeert echt een nieuw lexicon te ontwikkelen wat in alle disciplines zou moeten worden gebruikt. Condities bijvoorbeeld. Zo krijg je veel meer dialoog met elkaar, in plaats van zo langs elkaar. Ik snap de kritiek maar het is misschien ook een kans.

Sanette: Onze vragen zijn op. Dankjewel!

Van Hall: Denken jullie erover om het in het Engels te schrijven? Er is in Amerika heel veel interesse in wat er hier gebeurd in Nederland. Ik denk dat ze het heel erg graag zouden willen lezen, en dat je dus de kans krijgt dat het gepubliceerd zou worden door de International Big History Association. Dan moet het alleen wel in het Engels. Ik denk dat ze het heel leuk zouden vinden om te zien wat de ontwikkelingen zijn. Daar moet je even over nadenken maar ik denk wel dat dat heel handig is.