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A CRITICAL LOOK AT ARCHAEOLOGY TEACHING IN ESTONIAN HIGH SCHOOLS

Most commonly archaeology is not recognized as a curriculum subject but may be introduced into history teaching, like in this case study in Estonia. In this article I present an analysis of how archaeology is presented in Estonian National Curriculum and high school (e-)textbooks and what kind of archaeology qualifications history teachers will get in the teacher training in the universities. The aim was to analyse the current situation and possibilities of archaeology teaching at Estonian high schools. Analysis of history and civic teacher training showed that they get the know-how how to teach but what to teach (including archaeology) remains problematic. Archaeology is presented in Estonian National Curriculum, but the prehistory learning goals should be redone concerning the methodological skills and knowledge of content and archaeology goals. It is not about the volume of archaeology, but how and what is taught. Archaeology can teach humanity, which is the most important learning outcome. (E-)textbook analysis indicated that not all textbooks are well equipped with archaeological data. The result of this study shows that archaeology is part of the Estonian history teaching at high school and the extent is good, but it should be taught in a more effective way.

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Introduction

History professor David Vsevirov (2008) noted ‘History is dead and alive at the same time’. History is present in our everyday life in objects, in buildings, in documents and also in traditions, in languages, in laws, etc., but at the same time history is permanently and forever lost and you cannot turn the clock back.

So how can you teach it? It can be only partly reconstructed based on our knowledge of the past and present day world. Our historical understanding is complicated and constantly developing and changing. There are more factors than history itself, such as the nature of teacher training and the qualifications to teach prehistory, the curriculum, textbooks, but also the rapidly changing environment. Students are now accustomed to digital methods of presentation and teaching has to adopt new ways, and all this makes prehistory teaching even more complicated.

The aim of this article is to give a systematized overview of the present state of archaeological teaching at Estonian high school and produce an analysis of the potential for teaching archaeology in Estonia based on high school curriculum. At first teacher training in universities will be analysed to see what kind of archaeological background they will have gained when they graduate and go on to teach. Emphasis in the curriculum of history is distorted. In terms of volume and also in essence contemporary history prevails. Textbooks (both printed and digital) will be analysed to see how the archaeology part is written considering both archaeology and curriculum objectives.

The imperfect and often skewed knowledge of history teachers, coupled with time constraints, creates a situation where sometimes archaeology is taught less than the curriculum requires and some prehistoric periods are poorly taught or entirely absent.

History teacher training

Teacher training at Estonian universities

Teacher training's importance is hard to overestimate. Teacher awareness of what archaeology is and how it contributes to our knowledge of the past is essential to delivering the archaeological element in the curriculum (Copeland 1999). Teacher competences are described in occupation standards for teachers 2013 (Eesti Õpetajate Liit). To be a history and citizenship teacher you need to have a master's degree (2 years) which you can get at Tallinn University and the University of Tartu. It is common in Estonia that history teachers give citizenship lessons with political, economic, social, and cultural dimensions, plus more practical aspects, such as visiting a court session, a local authority, government department, etc. This is a relict from the Soviet era when history teaching and citizenship were ideological.

The terms of acceptance at the University of Tartu for history and social studies teachers' MA are shown in Table 1. There were 7 vacancies in 2018.

Table 1. Terms of acceptance in Estonian universities. (Tallinn University History and Civic Teacher Curriculum, 2017; University of Tartu History and Civic teacher, 2017)

University	MA at Tallinn University	MA at University of Tartu
Prerequisite	Degree in history	Degree in history or educational science
Terms of acceptance	Entrance examination (oral and written test)	BA medium grade Test of profession
MA subjects	No compulsory subjects in archaeology. Many pedagogical subjects, such as Emotional and Social Aspects of Learning, Supporting Learning and Development	No compulsory subjects in archaeology. Many pedagogical subjects, such as Theoretical-Methodological History Seminar, Teaching and Reflection

There are no compulsory subjects that describe archaeology, object-based teaching or archaeology teaching methodology in the master's degree programme in the University of Tartu (see Table 2), but there still exists the possibility to study archaeology via elective courses. The reason might be the teacher educators' own lack of knowledge of archaeology (Copeland 1999). History and Civic Didactics objectives are to give competence in the subject area, designing and delivering lessons, and gaining competency in developing sound historical thinking using historical sources (Study Information System 2017). There is nothing about how to teach archaeology-based lessons (prehistory) or on interpreting archaeological material. Therefore, future teachers have a lack of archaeological knowledge if they have not educated themselves in archaeology via elective courses.

A Bachelor degree in history should give professional knowledge for teaching, but most graduates have an incomplete data in archaeology. Terms of acceptance to History and Citizenship MA at the University of Tartu do not require any archaeology modules. There are no compulsory courses in archaeology if a student chooses to study art history or archival science or general history, etc. They get an archaeological background only when they take archaeology modules

Table 2. Opportunities to get archaeological knowledge at BA level. (Tallinn University BA programs, 2017; University of Tartu BA programs, 2017)

University	BA at Tallinn University	BA at University of Tartu
Structure of degree (180 ECTS)	Main field of study which consists of nine compulsory modules: 1) University-wide courses 18 (ECTS) 2) Estonian History in Regional Context 24 3) Electives 48 4) Language specialization 6 5) Introduction to Humanities 18 6) Practice 24 7) Key Issues in European History 24 8) Open elective courses 12 9) Bachelor Examination 6	The main specialization: 1) Two base modules 2 x 24 (ECTS) 2) Specialist module 24 3) Narrow field module 24 4) Elective module 12 5) Final examination or dissertation 12 Minor specialization (may be chosen from the same, or from any other curriculum) 6) Narrow field and speciality modules 2x24 7) Elective subjects 12
Compulsory modules that contain archaeology	Estonian History in a Regional Context, including seminar on Estonian and Baltic History and seminar in Scandinavian History	Core module in history or in art history. Specialist module in archaeology (others are archival studies, Estonian history, art history, contemporary history, general history)
Subjects that contain archaeology	1) Man and Material culture, 2) The Sensory Landscapes of the Past, 3) Networks of Trading and Communication, 4) History of Environment and Technologies	1) Preservation of Archaeological Finds, 2) Introduction to Osteoarchaeology, 3) Warfare in Pre-Historic Estonia, 4) Iron Age Archaeological Finds in Estonia

(see Table 2) or elective courses. Basically they can choose a variety of courses from every department of the university, but there are specially designed optional courses too (see Table 2). Therefore a history teacher's archaeological knowledge is random and depends on their choices of what they did for their BA. It has been described as a 'cycle of deprivation' (Corbishley 1999). Pupils learn out-of-date ideas and then these students go to teacher training courses and there is no one to put the record straight, and in turn they pass on the deficiencies on to their pupils. To be in front of the class, the teacher should know more than what is written in the textbooks and further discussion, below, will show that some textbooks are rather poor where archaeology and prehistory are concerned.

There is an analogous situation at Tallinn University. They require similar entry requirements (see Table 1) to apply, and MA cyclical learning (i.e. 2–3 evenings per week and/or weekends, with five study sessions per term). Subjects and modules vary, but in general they are the same as at Tartu. There are no modules about interpretation of historical and archaeological sources or historical thinking. Tallinn University gives a good background in teaching educational theory within different subjects. For example courses such as Emotional and Social Aspects of Learning and Supporting Learning and Development (Tallinn University History and Civic Teacher Curriculum, 2017). This results in teachers knowing the "how", but they know less of the "what" to teach.

Tallinn University's history BA has nine compulsory modules (see Table 2). Based on the BA curriculum's compulsory subjects, history students get a better overview of archaeological material (Tallinn University BA programs 2017). The University of Tartu students have the opportunity to choose archaeology speciality modules, where they concentrate only in archaeology (University of Tartu BA programs 2017). In general, young teachers' archaeological knowledge is random, based on their BA choices and they do not get archaeological teaching theory skills in the MA. The same problem continues into the 21st century in Estonia, and it was already pointed out in 1991 by A. E. (Gene) Rogge that few teachers have ever been on archaeology courses and they do not feel qualified or interested in teaching archaeology (Rogge 1991). Changing the teacher training courses and including archaeology didactics would considerably improve the current situation.

Teacher training courses

Estonian teachers have a professional development obligation. In 2014 the Ministry of Education and Research issued a decree, where the current situation of CPD (Continuing Professional Development) is described and methods how to improve it, so that CPD would serve teachers' needs (Ministry of Education and Research 2014). I have researched teacher training opportunities for CPD over the past five years. Seminars and lectures are one way to improve teachers'

knowledge of archaeology. But this presents a number of issues, such as teachers are overwhelmed with mandatory curriculum requirements and they receive lots of unsolicited supplemental educational materials (Rogge 1991). A lot of training and teacher packs adverts come via e-mail and it is hard to examine them all. CPD has to motivate teachers, and has to be professional, intensive, effective and the title should reflect the real content (Oja 2016).

There have been some archaeology seminars for teachers with an Estonia, Latvia and Russia cross-border collaborative programme, one part of which was *Archaeology, Authority and Community*, with seminars organized for teachers in archaeology 2012–2014. This was attended by 24 teachers every year. Archaeologists gave the latest information about archaeology and how to connect it to the curriculum and teaching. In October 2017 a similar format was tried at the University of Tartu, but only 5 teachers registered. Teachers need to see direct benefits to want to participate in workshops (Rogge 1991). Either they did not see the benefit or it was badly advertised, or they just were not interested. It is essential to have personal contact for successful outreach, and it seems that we failed on that too. In 2012 and 2013 the Estonian History and Civic Teachers Association, with 360 members, organized summer training sessions with circa 90 teachers attending, at which archaeologists were asked to make presentations. In those cases, personal contacts were made and teachers were asked to participate.

It is a common trend that publishers organize a seminar when a new textbook comes out. For example, Avita published *Estonian History I* in 2014 and the authors Aivar Kriiska and Anti Selart gave a talk and a good overview about the current situation in science. Museums sometimes organize training days connected with exhibitions, e.g. the Estonian Maritime Museum's Vikings show and the Estonian National Museum archaeology programmes for students. Otherwise continuing professional training is mostly concentrated on 20th century history, the holocaust, values and general teaching, so it is hard for history teachers to be up to date in archaeological research and it seems that they are not so interested in it either.

Still, it is vital to reach teachers as they can have an impact on hundreds of students (Selig 1991). Via teacher training it is possible to spread the knowledge, skills and the will to teach prehistory. 'Teaching teachers' is the most effective way to ensure that the historic environment is used in teaching (Corbishley 2004). To do that it is important to lobby teacher educators so that they understand the contribution that archaeology makes to the curriculum. How will we empower teacher educators to deal with archaeology (Copeland 1999)? In my own case, I have an agreement with the University of Tartu Archaeology Department that I will teach an optional archaeology didactics course, which is the first step in higher education to educate teachers in archaeology. However, a lot of work still needs to be done.

Estonian National Curriculum

Theoretical background

Estonia has a unique and difficult historical background. It is balanced somewhere between the ideologies of East and West and this influences our present-day thinking on matters such as history teaching, textbooks and curricula, but also research. History writing was influenced by Soviet ideology and history was manipulated for ideological purposes (see for example Kreegipuu & Lauk 2007; Selart 1997). Independence in the 1990s was romanticized by some authors (Tamm 2009) and this political situation influenced the school history curriculum (Haljasorg 2017). Most of the soviet education was knowledge-based and ideologically driven, but there were also innovative teachers who valued student-centred teaching and were using different methods and creating new materials (Oja 2016). Soviet textbooks were replete with ideology. Through textbooks they wanted to raise proper citizens and therefore there were clichés like friendship with Slavs, class warfare, ‘us – them’ polarization. This paradigm has been replaced, and at the moment teaching is looking more to the West. For example, the European Commission (2006) and the Estonian National Curriculum (2011) key competences are the same. This is the reason why the comparison of teaching methods in my research is taken from western paradigms, since teaching is heading towards the western approach.

Archaeology is not an individual subject in school, but prehistory is included in the Estonian National Curriculum¹ as a part of history lessons. Estonian prehistory and ancient Greece and Rome are in the Estonian National Curriculum, so thematically archaeology fits there perfectly. It is important to note that some archaeology skills may be taught in other disciplines outside archaeology (Henson 2004a) but I am not focusing on those. There are some examples where archaeology is taught as an individual subject (e.g. Dyer 1983; Jeppson & Brauer 2007) and currently in Estonia this is happening at least in three schools, but most commonly it is part of history.

Archaeology provides examples for teaching in a wide variety of subjects, because it is interdisciplinary and opens up the potential for developing new educational applications (McManamon 1994). Teachers must comprehend that archaeology materials are across a broad spectrum relevant (Rogge 1991) and that giving students the whole range of history helps to understand the processes in human history. Within archaeology, prehistory is especially important. At that time changes took place which are of great importance and significance for modern life, for example, agriculture, ceramics, art, and religious beliefs, etc., all of which are vital for us. ‘Looking at long-term human interaction with the environment is

¹ The National Curriculum is an Estonian Government decree, which sets out the main ideas and themes in teaching and integration, criteria of marking and general notes. For subjects, the themes in each class and the learning outcomes are also laid down.

a necessary part of understanding the effects of modern lifestyles and farming practices on the climate and landscape' (Henson 2011, 122). This is as true for the prehistory period as it is now.

Estonian school system

The Estonian school system is divided into three parts. It starts with primary school 1st–4th grade (ages from 7–10), elementary school 5th–9th grade (ages from 11–15) and high school (secondary school) 10th–12th grade (ages from 16–19). The first two levels are obligatory and after that they have multiple choices where to go. 11.198 students graduated 9th grade in 2017 and 72% of those went to study in high school, 25% went to craft school, 3% did not pursue their education (Educational Eye 2017).

There are many reasons why it is important to concentrate on high school:

- 1) At age 16–19 – they understand more complicated things. Based on Piaget's Stages of Cognitive Development, the formal operational stage starts around 11 years old, which means that during this time, people develop the ability to think about abstract concepts, and logically test hypotheses (Piaget 1947). Students start thinking scientifically and therefore they are able to understand more complex ideas in archaeology. This theory has been modified by many, for example constructivist Jerome Bruner argues that pupils of any age are capable of learning complex information by having simplified ideas at first and then re-learned in more complex ways (Bruner 1960), so he sees it as a process.
- 2) 72% students continue their studies in high school (Educational Eye 2017).
- 3) History is obligatory for everybody in high school and Estonian prehistory and Ancient Greek and Roman history are in the National Curriculum. Compared to England, where history is only compulsory up to age 14 and only chosen by 40% at the age 14–16 (Gill & Williamson 2016).
- 4) At high school level, you have more flexibility, so teachers can teach extra courses. For example, I myself have designed an archaeology course (intense one week course and one term course with field trips).
- 5) A subjective factor is that I have taught in high school for 12 years and therefore I have acquired know-how and experience of this phase of education.

History is compulsory in high school for all students and they have to pass six obligatory history courses which are described in the Estonian National Curriculum. Fulfilling the curriculum is a laborious task, since curriculum designers wanted to put in the whole history, as Peter Stone strikingly wrote 'Plato to NATO' (2004, 1), but they are planning to reduce the content.

'Archaeology is ultimately about development of cultural identities and therefore it is inextricably bound up with politics' (Merriman 2004, 4), thus inclusion and exclusion of archaeology is often linked with politics (see for example Stone &

MacKenzie 1990; Funari 2001; Duineveld et al. 2013). Therefore it is important to pay attention as to what we teach in schools. Hamilakis noted that ‘pedagogy is part of the field of cultural politics, a contested domain, a public sphere where knowledges, views and perceptions on the past and the present are debated and contested, (...) reproduced and legitimized’ (Hamilakis 2004, 287). Estonia’s political background (Independence declaration in 1918 and being under the Soviet occupation in 1944–1991) influences the emphasis on history courses which are focused on contemporary history (3 courses from 6 compulsory courses) in the National Curriculum.

Each school can choose the length of the lesson. For example the school where I teach one course used to consist of eighteen 75-minute lessons. Each school can choose the order of the courses and the teacher can make small modifications to the curriculum and choose the teaching methods, materials and textbooks. The first course is *General History* (world history) which includes Greek and Roman history and the Middle Ages. Then there are two courses of *Estonian History* (prehistory until 1905). Three courses of *Contemporary History* (World and Estonian history). World history and Estonian prehistory and Middle Ages are based on archaeological material.

Method and analysis of curriculum

In curriculum analysis research, there are many examples and methods to observe a study, some of which are carried out in Estonia. For example Heiki Haljasorg (2017) has researched Estonian curricula from 1874 to 2010 and analysed the content from an ideological point of view. He looks at terms, dates and names, such as the end of Ice Age, the Kunda culture, the Estonian belief system, bishop Fulco (Haljasorg 2017). These are actually irrelevant from an archaeological point of view, since they do not help us to understand the cultural development, but give instead a glimpse of ideology being used to influence the curriculum. It would be interesting to compare how previous curricula have approached prehistory and which points they have highlighted and compare this with the archaeological knowledge at the time.

Looking at learning outcomes and content are one way to define curriculum efficiency, to see if the implementation of the curriculum gives a valid outcome for students. The curriculum analysis framework is based on Margaret E. McNeely (1997) who analysed five different methods. From these, I have chosen Project 2061 Curriculum-Analysis Procedure as a structure for my analysis, since it reviews a variety of prepared curriculum materials aimed at learning goals, which are imperfect from an archaeological point of view.

Project 2061 Curriculum-Analysis Procedure has five steps, but I have modified those for three steps instead (McNeely 1997, 129):

- 1) Identify specific learning goals to serve as the intellectual basis for the analysis – in this case it is to analyse the archaeological material in the curriculum.
- 2) Preliminary inspection of the curriculum materials to see whether they are likely to address the targeted learning goals. Analyse the curriculum materials for alignment between content/instruction and the selected learning goals.
- 3) Summarize the relationship between the curriculum materials being evaluated and the selected learning goals.

At first I looked at the Estonian National Curriculum learning goals, which I could relate to archaeology. In *Estonian History I* course there is a prehistory part and a medieval period and in the *General History* course there is an Antiquity and Middle Ages, which contains archaeological material (Estonian National Curriculum ad. 5, 2011).

Secondly, learning goals in the Estonian National Curriculum support archaeology-based material usage in teaching and the objectives such as student understanding of the differences between historical fact and interpretation, and the description of historic periods through events, processes and period, all of which are relevant to archaeology (ibid.). Those learning goals have to include both methodological skills, as well as knowledge of content, but in archaeology the goals (see below) are even wider. Archaeology teaches us about humanity, what it is to be human, across the span of time.

Archaeological learning goals are (Henson 2004b, 31):

- 1) Recovering cultural remains in order to learn about the past.
- 2) Analysing the evidence to produce interpretive histories in order to learn from the past.
- 3) Converting remains into commodities as heritage to enable people to make use of the past.

Amongst the objectives in the Estonian National Curriculum there are also learning goals of social studies, history teaching objectives, and history educational objectives and skills list at the end of high school education. This also includes learning outcomes at the end of the course and at the end of the high school. The National Curriculum Social Study appendix is 40 pages long.

All eight learning goals of Social Studies concerned with what it is to be an Estonian, a world citizen, a human being with respect for the democratic values and human rights. For example, students need to understand the processes of social change and events, have knowledge of different cultures and respect for them, associating learnt things with everyday life, etc. On the other hand, nine objectives of history education are rather more general. For example, students will have appreciation of the past, value cultural diversity, be able to apply critical analysis to evidence, ability to use history terminology and understand differences between fact and interpretation, etc. (Estonian National Curriculum ad. 5, 2011). History teaching objectives are much the same as the history educational objectives. History teaching objectives aim to equip students with an ability to analyse and understand the world they are living in, and to have the knowledge to orientate in

themselves in their native environment and world past, heritage and different value systems (Estonian National Curriculum ad. 5, 2011).

The most useful objectives are the ones that include both a content and a behavioural or skill component (Tyler 2013). In the Estonian National Curriculum the content has been left behind, it is not promoted in high school learning outcomes either (see Table 3). The opposite problem is in prehistory learning outcomes. One important skill, empathy, which is the ability to put yourself in another person's situation and consideration of the values of cultural diversity (Estonian National Curriculum ad. 5, 2011), is omitted. This could be easily included in the teaching of archaeology and would fit well with archaeological goals. Ethical values and social differences in prehistory could be linked in the present world to

Table 3. Learning outcomes of Estonian History I prehistory and at the end of high school

Learning outcome at the end of high school	Prehistory learning outcomes
1) Knows the characteristic features and mind-set of different eras, the links between Estonian history with European and world history, understands the consistency of historical development and events and the reasons of different interpretations of them	1) Knows the most important Estonian prehistory periods; understands archaeological sites peculiarity
2) Has knowledge of the most important cultural achievements of the world and acknowledges the consistency of different cultures, respects cultural diversity, is aware of the importance of culture in self-determination, maintains and bears the cultural heritage	2) Describes people's living environment and brings examples of their occupations and changes of living environment
3) Compares and analyses different political, social, state and cultural development directions and problems, describes the effect of ideological and technological changes to people lives and values, compares the influence of big countries to the world economy and politics on different eras, analyses the cooperation of different countries and the solutions to world conflicts	3) Describes prehistory people's contacts and influence with neighbours
4) Finds, sorts, references and analyses critical information, different sources like maps and opinions, evaluates the correctness of sources or approaches to a question, differs fact from opinion, explains the meaning of different interpretations of events and processes	4) Describes Estonian administrative order and economics at the end of prehistory
5) Recognizes the terminology of history, different ways of teaching, knows and adjusts own mistakes, puts together papers and studies, writes topics for debates, takes part in discussions, uses maps, expresses knowledge and skill both orally and in written form and uses the tools of ICT	5) Explains and uses terms in the right context: site, archaeological culture, cemetery, hill-fort, county, parish, ancient Estonian army, animism
6) Is able to reconstruct the lives of people in the past and look at the world through their eyes and take into account peculiarities of different eras	

understand better the human behaviour. At the end of high school the learning outcome (see Table 3, No. 5) matches prehistory outcome (see Table 3, No. 5), but this terminology is outdated and poorly relates to archaeology learning goals and Estonian National Curriculum learning goals which emphasize processes and values.

The ability to learn from past, which is based on analysis of evidence, is totally missing in prehistory learning outcomes, although it is included in learning outcomes at the end of high school, history teaching, and educational learning objectives. Therefore prehistory learning outcomes are problematic in archaeology, but also from a curriculum and history teaching objectives perspective.

The second step is to analyse the content and learning goals of Estonian National Curriculum. Henson (2004b) analyses the English National Curriculum and notes that based on how the aims of teaching are incorporated in the curriculum orders will tell how the teaching is carried out in practice. It is mostly like that, but it also depends on the teacher how he uses the curriculum. There are three sets of study: learning about the past, learning from the past and learning to use the past (ibid.).

In the Estonian National Curriculum, one *General History* learning outcome is for students to appreciate the achievements and works, with sources, describing the particular period and evaluate critically those sources (Estonian National Curriculum ad. 5, 2011). One example of studying content is that students should know about Greek and Roman living environment and architecture (ibid.) which is based partly on archaeological sources and learning outcomes will match the content. In the 'medieval times' part, learning outcomes are for example that students should describe medieval society, the living environment and analyse critically different sources from that era, and to compare it with the Great Migration, society and living environment, city culture, etc. (ibid.). There is a lot archaeological information which should be taught source critically which also meets the requirements of the learning goals.

In the Estonian National Curriculum, *Estonian History I* course covers Estonian prehistory. In the Estonian National Curriculum there are general outcomes in history and course based sub-themes outcomes. There are five outcomes described in Estonian prehistory which are poorly linked to general outcomes in history, but they should support each other. Prehistory outcomes should be concentrated more on learning from the past, developing skills, but instead, they are all only learning about the past. There is a set of terms which students should know about such as site, archaeological culture, cemetery, hill-fort, county, parish, ancient Estonian army, animism (Estonian National Curriculum ad. 5, 2011). Those words are not relevant for an archaeological point of view and are outdated. Terms do not concern society and people in their everyday lives. Instead the curriculum should highlight the process and long-term view of human development, empathy and sustainable future. For example, one learning outcome could be a climate change and how people managed it or how they dealt with rubbish and

what was their carbon footprint. Outcomes meet the requirements of the objectives, and content partly supports the achieving of the objectives. Pedagogically it works, but it is questionable whether they meet the standards that archaeology has to offer.

McNeely (1997) suggests that an alignment exists between instruction and learning goals. For example in the Estonian National Curriculum's *General History* and *Estonian History I* support student learning of specific knowledge and skills as their learning goals, and the content helps to achieve these. For example, a student describes historic periods through events, processes, mind-set and people. This is also one of the prehistory learning outcomes: knowing and describing the most important Estonian prehistory periods based on their occupation and changes of living environment; based on interpretation of sites of people living environment and polity, belief and mind-set (Estonian National Curriculum ad. 5, 2011). Mind-set and belief interpretations need extensive background knowledge and understanding the bases of semiotics, which might not be feasible for students.

The third step is to summarize the curriculum materials (McNeely 1997), i.e. textbooks, which will be analysed in the next section. Curriculum learning goals are achievable for most high school students, but there should be more about archaeology learning goals, since it has a lot to offer. The curriculum is an official guidance for teachers and for other educators such as publishing houses and textbook writers, therefore the prehistory part should be updated in the curriculum. The educational objectives are essential, they 'become criteria by which materials are selected, content is outlined, instructional procedures are developed and tests and examination are prepared' (Tyler 2013, 3). Therefore it is important to note the archaeological objectives, which should be considered in the curriculum analysis, and there is a need to redraft the prehistory content and outcomes based on those objectives.

Textbooks and e-textbooks

Textbooks are the one place where almost all 15 to 19 year old students access archaeological material at school and it is also one of the main resources for teachers. The Estonian National curriculum is the official version which establishes how the teaching should be carried out, but how it is really done in schools and classrooms is another thing altogether. In Mare Oja's (2016) research, teachers admitted that instead of the curriculum they used textbooks to design their lessons. Teachers hope that textbooks are based on the curriculum and therefore it is extremely important that themes and illustrations take into account the school level, and are methodically and scientifically correct. There are hidden policies behind the writing of textbooks. Textbook writing will issue not only from pedagogy and the Estonian National Curriculum, but also current politically fashionable trends adopted by the Estonian Ministry of Education and Research, such as emphasis on digital technology, and textbook writing traditions and history itself.

Textbooks vs e-textbooks

Teaching is changing due to the new digital generation and digital age. This influences textbooks; for example, e-textbooks are a current trend and there is more emphasis in ICT, which is one of the key competences in the Estonian National Curriculum. E-textbooks are gaining popularity, but because of the cost many schools cannot afford them: schools can buy an e-textbook licence only for a year and must renew it every year, therefore printed textbooks are still widely used since once you buy them, you can use them for several years. Therefore it is justified to analyse both, although the content is roughly the same, but they differ by function.

Anthony Haynes (2001) was already concerned that digitalization might lead to the death of the textbook, but 17 years later printed textbooks have not yet disappeared, although there is a growing trend in using e-textbooks and e-lessons, but still, the question is in the air. Yin Zhang & Sonali Kudva (2014) note that e-books are often adapted from the printed book, but have not yet managed to take over all the roles of books. There are various studies about e-books, but in this case study it is important to know that they are mostly carried out in the United States which has a different cultural background. But as a teacher I have noticed similarities, so it is possible to draw parallels and find related features.

Estonian history textbook analysis

Method and textbooks

There are two main history textbook publishers in Estonia: Avita and Maurus. This analysis is influenced by the fact that I have used Avita textbooks at school for 12 years and only read but never used the Maurus textbooks for teaching. To obtain a reliable and valid textbook evaluation, criteria have been selected which are based on Falk Pingel's *UNESCO Guidebook on Textbook Research and Textbook Revision* (1999, 2010), Jaan Mikk's (2000) *Textbook: Research and Writing*. In addition, I will analyse the e-textbooks using Best European Learning Materials Awards (BELMA 2017) evaluation criteria. BELMA is chosen extra for the e-textbooks, since textbook content has already been analysed and BELMA allows to analyse other features which e-textbook offers.

Pingel (2010, 71) gives a general list of 5 criteria, listed here with some modification:

- 1) Textbook sector components such as educational systems, curricula (is described earlier in this paper), in section two structure of publishing houses.
- 2) Formal criteria: bibliographic references, target group.
- 3) Types of texts of presentation. Descriptive author's text, illustrations, sources, exercises.
- 4) Analysis of content: factual accuracy, completeness, errors, up-to-date portrayal, topic selection/emphasis, proportion of facts and views/interpretation.
- 5) Perspective of presentation: problem-oriented, rationality/evocation of emotions.

The evaluation goal is an analysis of content that examines the text to understand how archaeological material is presented: how they meet the requirements set by the curriculum and archaeology learning goals listed in the previous section; which science-based knowledge students get; how it helps to understand archaeological material and develop their critical thinking; and to avoid using low quality textbooks or raise awareness of textbook problems. Four textbooks will be analysed: *Estonian History I* (2014) and *General History* (2015) published by Avita, and *Estonian History I* (2013) and *General History* (2013) published by Maurus. *Estonian History I* course content was researched earlier (Vijand n.d.). *General history* content is not analysed in detail.

Based on formal criteria it is important to observe who the authors are, who the target group is, and how bibliographic references are made (Pingel 1999). The target group of those textbooks is high school. There are some problems with references. Only Avita's *Estonian History I* has a list of illustrations and maps with references. Avita's *General History* and Maurus textbooks have short source references for the illustrations, both claiming that they are following the copyright, however Maurus did use some photographs and maps without permission or acknowledgement and had to remove them in the later edition.

The prehistory section in *Estonian History I* (2014), published by Avita, was written by archaeologists Aivar Kriiska and Ain Mäesalu whilst historians Anti Selart, Inna Põltsam-Jürjo, and Pärtel Piirimäe wrote the part on the Middle Ages. A *General History* which covers Ancient Greece to the Industrial Revolution was written by historians Mait Kõiv (antiquity), Linda Kaljundi (Middle Ages), Mati Laur (Modern times), and Tõnu Tannberg (contemporary history) (2015) – are all accredited scholars from the University of Tartu and Tallinn University. They have written textbooks before, which means they have both the know-how and up-to-date data. All high school textbooks by Maurus are written by Mart Laar and Lauri Vahtre (Laar & Vahtre 2013; Vahtre & Laar 2013), politicians, who have been members of Parliament, and active as part-time historians and ethnographers. Therefore their research is done sporadically, but they have long experience in writing textbooks. In the Maurus textbooks, archaeologists were not included in the prehistory section, which adversely affects the visual material and currency of content. The Avita textbooks were written by researchers who are active in the field and reviewed by teachers, so both the quality of information and currency of data were combined.

It is arguable whether textbooks should be written by scientists or not, since they use complicated language and they have little knowledge of the requirements of schools. Scientists usually have the most up-to-date data, know what is going on in the field, and have access to different resources that they can use for writing a textbook. If reviewers are teachers and editors who are professionals, then the text is adjusted to be understandable for students at various school levels. It is the publisher's duty to make it suitable for a specific school level. Co-operation between authors, reviewers, editors and teachers is relevant because

that way it is most likely that a textbook will meet the requirements of the curriculum and is suitable for students and learning goals are achieved.

Content analysis

The next important topic is an analysis of content, which means factual accuracy, completeness, errors, up-to-date portrayal, topic selection, emphasis and representativeness, extent of differentiation, balance of facts versus opinions and interpretation. And then look at the content in the perspective of presentation, is it comparative or contrasting approach, problem-oriented, rational or evocation of emotions (Pingel 1999).

Both *Estonian History I* course textbooks follow the same structure that is in the curriculum: prehistory, medieval times and 16th century. There is a different output in prehistory – Avita (41 pages) is more detailed compared to Maurus (modified to the same size of the Avita textbook at 29 pages). But in Modern History it is the opposite – Avita has less content than Maurus. In both textbooks the chapters are divided into subheadings that help students navigate and understand the material. Text with well-structured sections and sub-themes gives a better overview of the chapter, and it is important to highlight relevant words. For example, the Stone Age is divided into two chapters in the Avita textbook, the first chapter being *Foraging Stone Age in the territory of Estonia* has four sub-themes: 1) settling of the territory of Estonia, 2) settlements, 3) subsistence, 4) tools and everyday items, and another chapter for *Transition to farming economy in the end of the Stone Age and start of the Bronze Age* with sub-themes: 1) changes in the east coast of the Baltic Sea, 2) subsistence, 3) tools and everyday items (Kriiska et al. 2014) In this case it follows the same structure and it is easier to understand. The chapter title contains a verb which hints at what the chapter is about. The last three chapter titles in prehistory mention the period and do not give an activity to further explain the content. The Maurus textbook has only one chapter titled *Stone Age* with three sub-themes: 1) people of Kunda, 2) Comb Ware, 3) Corded Ware and boat axes (Laar & Vahtre 2013). Chapter titles are simple and sub-themes are based on the archaeological cultures, but there is misleading information, such as the sub-theme covering Narva Ware which do not belong under either Comb Ware or the Kunda culture, and which is no longer used in archaeological terminology as a synonym for the Mesolithic period, instead it marks a period within the Mesolithic Era.

But first of all it is necessary to see whether the content meets the curriculum and archaeology learning goals (see below).

Avita's textbook

Learn about

For example (3):

- a) Comb Ware and Corded Ware people built above ground, but also intended square houses. Excavated houses were 50–60 m² near Riigiküla archaeological site in Narva. (p. 20)

- b) Salme burial ship. There were 7 men buried in the first ship and 34 in the second one in four layers, from the age of 18 to 50. A lot of marks of violence were found on bones. (p. 37)
- c) On the basis of bones, Estonian inhabitants were rather tall: average height was 172–173 in western and northern Estonia. Women were shorter, for example northern Estonian Pada cemetery dating from 12th–13th century, the average height was 158. (p. 40)

Learn from

For example (3):

- a) The same basic range of tasks was needed in the past as now, but we adapt our technology to cope with these. (p. 7)
- b) All societies need to make sure the younger generation is educated and the knowledge, experience and skills are passed on from the elders – do we really do this today in our education system? (p. 7)
- c) Contains data about sea level rise and climate change, which helps us understand that people must learn to live with environmental changes. (p. 10, 19)

Usage of the past

For example (3):

- a) Kaali Meteorite Lake is under heritage and nature protection. (p. 31)
- b) Iron Age house reconstruction near Rõuge hill fort 2011, based on archaeological excavations materials from Rõuge hill fort. (p. 32)
- c) The experiment to live a week in the Iron Age house reconstruction was carried out in the winter 2013. (e-textbook)

Maurus textbook

Learn about

For example (3):

- a) Kunda culture: domesticated animal was the dog and mostly people were hunters and fishermen. The main hunted animal was elk, from which people got leather and made tools from the bones. (p. 19)
- b) The oldest signs of farming – based on oat pollen – are from northern and western Estonia 4000 B.C. (p. 22)
- c) 42 young men's skeletons were found near Salme village. They were buried in two Viking ships. There were marks of lethal injuries on the skeletons so it was a battle burial. (p. 32)

Learn from

This is harder to identify in Maurus because it is more like a narrative and the story of being Estonian. I was not able to find *learn from the past* information.

Usage of the past I found two.

For example (2):

- a) Rõuge prehistoric Viking Age house was built as an experimental archaeology project in 2010 by University of Tartu students near the Rõuge hill fort. (p. 35)
- b) Video about new pagans using the heritage site for their ceremony. (e-textbook)

Comparing the archaeological goals and archaeological information delivery in both textbooks (see above), there are differences. The first goal is mostly established in both textbooks – they contain information about the past, although there are inaccuracies in the Maurus textbook, such as the number of men in the burial boats. 7 plus 34 (Peets et al. 2012), in total 41 not 42, and many assumptions which are not explained. There are examples from the second learning goal – learn from the past – in the Avitas textbook, whereas I did not find any examples from Maurus. Both textbooks were rather poor in the third learning goal – there are only some examples how heritage is used in today’s world.

Another important factor is text comprehension and readability. Based on Dual Coding Theory (DCT): ‘concreteness makes text more comprehensible than familiarity; familiar, and readily comprehensible text is more interesting; concrete and interesting text is more easily recalled soon after reading; and concreteness has an even more pronounced benefit on delayed recall’ (Sadoski & Paivio 2001, 185). In this case I looked at three points: a) the texts medium sentence length – max 15 words are executable for older students; b) familiarity of the text; c) use of foreign words (Mikk 2000).

Both books point out new and relevant terms and Maurus has a short dictionary at the end of the book, whereas Avita has word explanations in small boxes in the text. The length of the sentence in the Maurus textbook in the *Bronze Age and beginning of the Iron Age* chapter extend from 3 to 38 words. From 84 sentences 28 (33%) have more words than recommended, which might make the text difficult to follow, see Fig. 1. The length of the sentence in the Avita textbook in the *Farmers of the end of the Bronze Age and beginning of the Iron Age* chapter extend from 4 to 28, see the Fig. 1. From 104 sentences, 19 (18%), are too long for this age group. Figure 1 shows that the sentence length criterion has been taken into account when writing the Avita textbook. The Avita

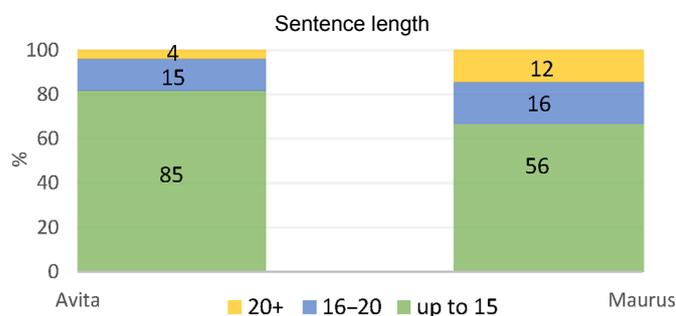


Fig. 1. Sentence length in the textbooks.

textbooks are well-structured and concrete and thus comprehensible. Sometimes they seem complicated/fragmented for students since they have to follow different charts and evidences and associate it with the text, therefore it is like a puzzle what students have to put together. In today's world it is common for textbooks to have more illustrations and less text, but students need narrative too.

Another relevant question is content, what it tells about the past and how students can visualize it through the narrative and/or evidence presented in the textbook. One issue is how much is written about people from the past, how they lived, etc., and here we see a difference between the two textbooks. The Avita textbook has reconstructions of people and their lives based on archaeological evidence – such as the Salme ship burial from Viking Age and the 13th century Kukruse Lady. The Maurus textbook has a description, with some generalizations, and some of them are outdated. For example the chapter on religion, which should be critically looked at because it is based on the notion that through all of prehistory there was just one belief system, whereas of course it changed due to environmental, life-style and societal factors.

In the Maurus textbook there are more generalizations and several inaccuracies. For example the summing-up sentence for the Kunda culture: “Thousands of years go by without spectacular changes, generation after generation lived and died quite in the same conditions” (page 19), or “Comb Ware period indoor life was quite sophisticated, including tables and probably chairs and beds” (page 23). The first sentence generalization is not based on scientific fact and the second is not scientifically proven. This can lead students to wrong interpretations (Vijand n.d.). It continues with several things, such as ‘vertical looms were used in the end of Stone Age’ (page 23) and the textile impressions on ceramics show that there might be cloth, but vertical looms are not proved in archaeological data (ibid.). Instead of weak interpretations there should be explanations how archaeological interpretations are made based on sound evidence, such as archaeological artefacts. For example Mike Corbishley (2012, 236 ff.) describes object-based learning opportunities and techniques, which could be used also in Maurus textbook, such as questioning assumptions. That would help to understand the complexity of archaeological material and through that teach useful skills.

The Avita textbook has more scientific explanations which meet the requirements of the curriculum, for example, source-critical analysis can be made based on extra reading. Those scientific explanations and analyses enable us to integrate other subjects, e.g. science and literature – for example different scientific dating for the Kaali Crater, which is a meteorite crater where there is also a settlement. Students should be able to be critical of research sources.

A final Pingel's step is to analyse the perspective of presentation, such as problem-oriented, rational or evocation of emotions (Pingel 1999). The Avita textbook explains more about where the information comes instead of writing that archaeologists just assume or think that. Maurus has many sentences such as ‘presumably Kunda people spoke the same language’ or ‘houses might have been intended or above ground, but surely quadrangular and had gable roof’. Maurus

has recurring theme Estonians roots and being Estonian. Avita has more about being a human in general and also gender equality, for example they have men and female both presented in extra readings, such as Iron Age Kukruse Lady and Stone Age Tamula Man. Maurus tends to be more nationalistic and seeking to evoke an image of the past rather than helping students understand how we know and question the evidence. Avita is more useful as a tool for teaching historical and citizenship skills.

E-textbook analysis

E-textbooks are a new trend and a developing area in education and there have been various studies of their usage, mostly in the United States (see e.g. Sun et al. 2012). In recent years both Estonian publishers Maurus and Avita have been working on e-textbooks and *Estonian History I* e-textbooks are ready to use. I have not used these much myself, only in one lesson, but I have read them and looked at what kind of opportunities they offer.

BELMA (2017) suggest 8 criteria for assessing educational textbooks. Some of those criteria are appropriate for e-textbook evaluation, but not all are relevant from an archaeological or e-textbooks point of view nor e-textbook evaluation and some themes have already been covered in this article. Therefore I analyse e-textbooks based on relevance and reliability.

Relevance: refers to ‘the appropriateness of an issue in terms of its accordance with the needs, objectives and purposes of the users’ (BELMA 2017). E-textbooks are more centred on the learner than regular textbooks. E-versions have more possibilities, for example both Avita and Maurus have hyperlinks, which lead to word explanations if students do not understand what the word means and Maurus has further reading links if a student is interested in the theme and wants to know more. Teachers can also add extra comments. Students are familiar with multimodal compositions to express themselves; they use text, photos, sound, hypertext links, etc. in their social networking sites (Vie 2008), therefore it should be easy for them to follow e-textbooks. It is good that students can add their materials to complement and highlight the text too. It is a useful tool since their interaction with the subject helps them to memorize and understand information. In the Avita e-textbook, teachers are able to add their own materials which are appropriate for the class which they are currently teaching, and there are suggestions for further reading at the end of every chapter. It would also be useful to have a text which will be only seen by the teacher. For that, Avita, has special platform e-lessons, but they have not extended this to high school history lessons yet.

Avita has a description of the e-textbook which informs us that the text is supplemented with the newest scientific research results, which confirms BELMA requirement for factual integrity. The Avita text is enlivened with photos, graphics, charts and questions, plus it has a logical structure, which is easy to read. Maurus’ e-textbook follows mainly the printed book structure.

BELMA defines reliability as internal coherence (BELMA 2017). Almost after every paragraph Avita has a link where you can see which similar topics are

learnt before and where it will be dealt with later in history courses. For other subjects, there are hyperlinks, so you can read those textbook chapters when you are preparing for your lesson. For example, anthropogenesis is taught in different levels: 5th grade prehistory, 10th grade religion and the church in medieval times; and it is linked with several subjects such as biology of human evolution and how it is influenced by climate change. This is especially important in archaeology since it links every subject in school and therefore teachers can cooperate with each other. For further development, the ideal progress would be collaborative lessons. Maurus e-textbooks do not have similar listings.

In the future, I believe illustrative material, including videos, photos and maps should be provided. E-books that are regularly updated, can include more extra information, and considering their characteristics, teachers can choose what the best selection for a particular class is. But at the moment they look rather the same as printed textbooks. Visual material is different and this is analysed in the next sector.

We are heading towards using more e-textbooks, although various studies (see e.g. Potnis et al. 2017; Johnston et al. 2015) have shown that there is resistance against their use. Inclusion of use-profile in e-textbooks software might lead students to find e-textbooks more user-friendly (Gerhart et al. 2015). Similar studies should be done in Estonia to find out what students and teachers need, so e-textbooks can be adapted for their need. This will help to achieve learning objectives, outcomes and develop competences. Based on my own research and teaching experience I have some suggestions to improve e-textbooks: for example, they should have extra features so they could be used more widely and schools would be encouraged to buy those licences. They should have short tests for students, so they know if they have understood the point and give opportunities for making notes. Students could share class notes and questions about homework (Vie 2008) and help each other in studying in the e-environment. Teachers could use e-textbook for a peer-to-peer networking and team-working. There is need for other trusted hyperlinks than Wikipedia since the quality of Wikipedia entries are variable. It is possible to link the articles and museum web pages, or give film recommendations, such as Encyclopaedia of Global Archaeology. E-textbooks have good features, but could be developed to be more student and teacher friendly.

Textbooks and e-textbook visualization

Visualization theories

The Cognitive Theory of Multimedia Learning states that people learn more when they have words and pictures than only pictures (Mayer 2009). This theory is based on three assumptions: 1) auditory and visual senses are different channels to process information, 2) both channels have limited capability, 3) learning is an active process of filtering, selecting, organizing, remembering and integrating information based upon prior knowledge (Mayer 2002). Based on DCT in multimedia learning information can be obtained in both non-verbal and verbal

ways, and this dual capacity can ease the learning process because the same information is accessible via multiple routes (McTigue 2009; see also Sadoski & Paivio 2001). This is an important for the choice of images for the textbook. There is always interaction between illustrations and the text which is interpreted by the reader. Therefore images should be chosen carefully. 'As signs are fundamental aspects of signification there is a constant interplay between individual action and the theory of coding' (Pader 1982). Based on those theories, information should be presented in both verbal and nonverbal forms, and it should be taken into account while choosing illustrations for the textbook. Maurus and Avita textbooks have illustration(s) on almost every page, but illustrative material without a narrative or additional information is not enough. Lori McCay-Peet and Elaine Toms (2009) investigate the use of the images – for information or for illustration or for both. Illustrations in the textbook should be used for learning purposes and the semiotic narrative that the pictures might have, should be understood and investigated by author so that the image is giving the information to students that author wants.

Analysis of (e-)textbook visualization

Both Avita and Maurus publishers have visual material in their (e-)textbooks (see Table 4), but it is not enough for schoolbooks to simply illustrate the text, it should follow the didactic path. Pingel (1999; 2010) and Mikk (2000) both value the illustrations from a pedagogical point of view. The text and visual material should be related, sources and text should form a complex approach and complement each other. For example, reconstructions are important because there you can put people in which helps students empathize with past, making it more meaningful for them. We can also use images to help us learn from the past, e.g. how the sea level rise has influenced people who lived in the coast (see e.g. Henson 2017).

There are different theories in pedagogy; for example, Erin M. McTigue (2009, 144), referring to Mayer & Galini, says that the graphics benefit learners in three ways:

- 1) to guide attention to relevant information in the text;
- 2) to facilitate building internal connections between ideas in the text;
- 3) to facilitate building external connections between ideas in the text and the learner's background knowledge.

All these ways should be essential for choosing illustrative material for school books. But in prehistory there is third point too – evidence and interpretation, so students can see different versions of the past. For example, Maurus has a video about a neo-pagan winter celebration ceremony, which shows different options for interpreting the past – and the present. Avita has several historical sources, artefacts with a scale, for example a drawing and description of an 11th century blacksmith's grave in Raatvere. This complex find is very good for a profound evidence-based analysis, at first peer-to-peer work and afterwards a class discussion. Corbishley (2012) recommends not to overcrowd the text

Table 4. Avita and Maurus (e-)textbooks illustrative material in prehistory

	Avita textbook	Maurus textbook	Avita e-textbook	Maurus e-textbook
Illustration	113	49	177	33
Photos/drawings/ reconstructions	81	41	145	27
Maps	17	7	17	5
Schemes	8	0	8	1
Charts	7	1	7	0
Additional text	Additional chapters	Some in the middle of the text, separated with darker background	Additional chapters and 6 extra readings	15
Links to audio files	0	10 – alongside the page	5 (<i>Estonian Story</i> 2004)	13 (12 <i>Estonian Story</i> 2004)
Links to video files	0	3 – alongside the page	Link to Lascaux virtual tour	26 and 2 websites to 360 degree view
Links to Google maps	0	0	Inside the text as hyperlinks	24
Dictionary	Word explanations in a box in the chapter	Dictionary at the end of the book	Underlined words have explanations when you move on the word with cursor and dictionary is also in the end of the chapter	As hyperlinks to the Wikipedia or in box when you click to the word

with images. Avita e-textbook solution is several layers of images behind one and Maurus has hyperlinks, so a student who is interested in it, can take a deeper look at those without burdening the text.

Some of the Maurus printed images are of low quality or blurred (page 52, 53), but those pictures are of better quality in the e-textbook (Vijand n.d.). Two websites providing 360° views of present-day scenes are questionable as they do not reflect the ancient situation – this gives a wrong impression and background for evidence interpretation. When analysing the maps and images in the Maurus e-textbook, it is very hard to understand, from a didactic point of view, what the criteria were behind choosing those exact examples. For example, a photo of skulls in a museum or a present-day oat field – all these examples deform the actual information and cause confusion.

The Maurus e-textbook videos are mostly from *YouTube* and one video is deleted and therefore unavailable, but the link is still in the e-textbook. Therefore *YouTube* videos are not reliable. E-textbook is good that videos/links can be easily replaced or changed if they are not working or they are not suitable for students. Some *YouTube* videos, which are linked in e-textbooks, are made by

scientists and give students the European history background to understand better what is going on in Estonia. Making connections between Estonian and European history are required in the National Curriculum. Still, some of videos are out of date and need teacher explanation, since they are not made as a teaching resource. It would be more effective if those videos were created by the publisher and be closely related to the text. Videos are in different languages (see Fig. 2), to watch all videos students should understand English, Russian, German, with less than half, 32%, of the videos being in Estonian.

To understand complex ideas of what archaeology offers, it is essential to have judicious illustrations. Forethought is not evident in the Maurus textbooks, for example, the Estonian God's birthplace on Ebavere hill (page 53) is illustrated by a simple picture which does not reflect any new knowledge or create internal connections between ideas in the text nor make connections with the background knowledge of students. It would be useful to have notes in the body of the text to reference photos or charts to make it easier to make connections between text and illustrations. Readers should be provided with visual support which includes the components and requisites (McTigue 2009). That could be easily done in e-textbooks where you can give various layers to the picture. Avita has done it in the "Neanderthal and Homo sapiens skeleton" image – if you hover the cursor over bubbles in the image, explanations of the differences of the two species will be shown. For example in Maurus e-textbook anthropogenesis chapter, there are different skulls of humanoids shown which are numbered and named. But if you enlarge the photo then you no longer see the names.

The Google maps in the Maurus textbook are not very useful, for example the map titled *Land between the Euphrates and the Tigris*, shows today's Baghdad. Another map in this chapter just points to the Mediterranean Sea, the location of which all students, at the age of 16/17, should know. A map of the Mesolithic Pulli Settlement is situated 600 m away from the real settlement which is also

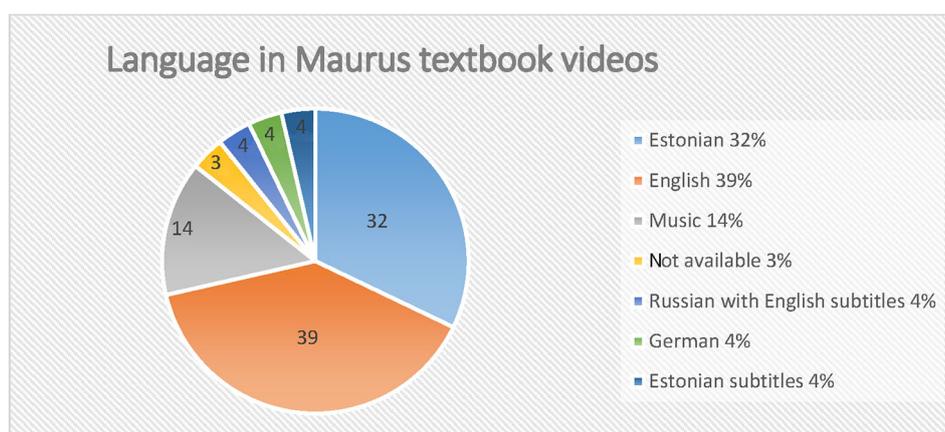


Fig. 2. Different languages used in videos in Maurus textbooks.

marked on the map. Google maps shows *Pulli kiviaja asulapaik* (in Estonian) exactly next to the river, not 600 m away, which could lead to the wrong interpretation. Similarly, with Kunda Lammasmägi, instead of pointing to the real site the Maurus map shows the modern Kunda Lammasmägi, showing photos of a resort! Instead of putting in one chapter two or more google maps, it would be useful to put one publisher designed map which considers the places mentioned in the text. For example Saha-Loo fossil fields and Asva Bronze Age site or Iron Age trading places like Novgorod and Kiev should be on one map. In the same chapter there are mentioned 4 hill forts, but only one is located on the map. Maps of Otepää, Tartu, Pihkva (Pskov) do not open: '404: Page not found'. Those maps are poorly connected with the text, and information that students could get from those maps are limited and misleading. E-textbooks can be easily updated and these kinds of mistakes should be preventable. For publishers it is simpler to update the material or delete inadequate material, add 3D modelling for special finds or archaeological sites, settlement layers and other site features, charts, animations, etc. That would help students to understand archaeological material. In general it is easier to make changes online compared to printed books where you have to release a new edition.

Conclusion

Archaeology (as prehistory) is presented in the Estonian National Curriculum at high school where it is included in the *General History* and *Estonian History I* course. In *General History* it is less than in *Estonian History I* course. In *General History* there is only one learning objective (students have to work with sources, describing a particular period and evaluate critically those sources) that is linked to archaeology. Therefore history teachers have to teach archaeology and different sources, but therein lies the problem – their knowledge is random and mostly built on their own readings. Based on the discussions I have had with history teachers, I reached the conclusion that it is often difficult for teachers who have been trained in history, to teach archaeology. They do it as if they are teaching history instead of using different, more appropriate techniques and sources. Therefore it is not the amount of prehistory in the curriculum, but the way it has been presented in the curriculum and taught in schools. The roots of the problem are hidden in the Estonian teacher training system, where various lessons on teaching theory are taught at the expense of the actual subject matter, which creates the situation where teachers know “how”, but the “what” remains problematic. Teacher training should include an optional course in archaeology teaching methods and prehistory should be taught in both universities, so that future teachers will have the opportunity to learn and gain knowledge on both the how and what to teach in prehistory.

Analysis has shown that prehistory is ineffectively presented in the curriculum and it influences the textbook writers if they follow the curriculum precisely. For example Maurus textbooks were poor in portraying archaeology, but Avita

textbooks were written by archaeologists and therefore diverse in scientific points of view and edited at an appropriate and feasible level for students. Therefore it is not the amount of archaeology that is problematic but the way it is presented in the curriculum and some textbooks.

The Avita high school history textbooks are written by archaeologists, reviewed by teachers and edited for high school level, therefore I recommend them for teaching prehistory. The Maurus textbooks are written by historians and their archaeological sources are of poor quality and illustrative material needs to be reviewed. The prehistory text needs correcting and more illustrative material should be added so that evidence-based teaching becomes possible. Therefore I would not recommend them.

Printed and e-textbooks need further research for comparison to see which support learning outcomes better. This research should include different stakeholders like teachers, students, publishers, and people from the Estonian Ministry of Education and Research. The ability of the e-textbook format to support particular learning goals would help to involve students more and that would help to achieve learning outcomes. E-textbooks have great potential as a tool for innovative learning, since the digital generation needs a new approach in teaching. It would be useful to be able to access the e-textbook simultaneously with the purchase of the regular textbook. This would help spread the habit of using e-textbooks.

Visual material is essential in the textbooks. The quantity does not matter and images are not just illustrative of the text, they should augment the text. Images provide a way of helping students to evaluate our interpretation of the past and their empathetic interest of past ways of life by, for example, showing people engaged in everyday activities. So a good reconstruction graphic can help to make the past more meaningful for students.

The current case study can be used for improving digital and printed textbooks and rethinking what students should learn in high school in archaeology.

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Liia Vijand

ARHEOLOOGIA ÕPETAMINE GÜMNAASIUMIASTMES EESTIS

Resümee

Ajalugu on samal ajal nii surnud kui ka elus. Ajalugu leidub kõikjal: see peegeldub ehitistes, dokumentides, inimese kujundatud maastikes ja ka traditsioonides ning seadustes, aga samas on ajalugu igavesti kadunud ja seda pole võimalik täielikult rekonstrueerida. See omakorda teeb nii ajaloo kui ka arheoloogia õpetamise keeruliseks.

Ülevaade ajaloost, sh muinasajast, aitab õpilastel mõista inimkonna kujunemislugu. Esiajal toimusid olulised muutused, näiteks põllumajanduse, keraamika, kunsti, religiooni kujunemine. Jälgides inimese ja looduse vastastikust koosmõju pikaajalises perspektiivis, saame teha järeldusi selle toimest kliimale ning maasti-

kule. Arheoloogia abil on võimalik õpetada protsesse ja põhjuse-tagajärje seoseid, mis on üks õppe-eesmärk gümnaasiumi riiklikus õppekavas.

Arheoloogia ei ole eraldiseisev õppeaine, vaid osa ajaloo õppekavast. Ajalugu on Eestis gümnaasiumiastmes kohustuslik õppeaine, mida õpetatakse kokku kuus kursust: kolm kursust lähiajalugu ja kaks Eesti ajalugu (muinasajast kuni 1905. aastani) ning üks kursus üldajalugu. Lähiajaloo ülekaal on tingitud 20. sajandil toimunud sündmustest, mis mõjutasid Eesti ajaloo kulgu, näiteks Eesti iseseisvumine ja Nõukogude okupatsioon.

Artikli eesmärk on analüüsida praegust olukorda arheoloogia teemade õpetamisel Eesti gümnaasiumides ajaloo- ja ühiskonnaõpetuse õpetajakoolituse, riikliku õppekava ning õpikute põhjal.

Ajaloo- ja ühiskonnaõpetuse õpetajakoolituses on probleemkohaks, et rõhku pannakse sellele, kuidas õpetada, aga mida õpetada, see jääb vajaliku tähelepanuta. Seetõttu sõltub õpetajate teadmiste pagas paljuski nende endi aktiivsusest ja sellest, milliseid valikkursusi ning eriala- ja suunamoduleid on nad bakalaureuse- ning magistriõppes läbinud. Samas jääb Eesti ajalooõpetajate koguarvuga võrreldes ajalooõpetajatele korraldatud arheoloogiaalastest koolitustest osavõtnute arv pigem väikeseks. Põhjusi võib olla mitmeid: nii huvi puudumine kui ka koolituse vähene reklaam, aga ka õpetajate suur töökoormus ja koolituste lai valik. Koolituste, teemapäevade jms kaudu õpetajani jõudmine on oluline, sest temast lähtuvad teadmised antakse edasi sadadele õpilastele ehk õpetaja teadmiste vajakajäämine peegeldub õpilaste teadmistes. Õpetaja teadmiste pagas peab olema suurem kui õpikus kirjas olev materjal ja õpikute analüüsist selgus, et osas õpikutes on arheoloogia teemade käsitlemine kesine.

Ajaloo õppekava muinasaega ja arheoloogiat käsitlevad teemad analüüsiti riikliku õppekava ning arheoloogia õppe-eesmärkidest lähtuvalt. Arheoloogia pakub mitmekesiseid võimalusi õppeainete lõiminguks ja õpetab inimlikkust läbi aja ning ruumi.

Arheoloogia eesmärgid on (Henson 2004b, 31):

- 1) ajaloo õppimine ehk teadmiste omandamine,
- 2) ajaloost õppimine ehk teadmiste kasutamine ja oskuste omandamine,
- 3) ajaloo kui pärandi kasutamine.

Eesti ajaloo kursuse muinasaja õpitulemustes puudub oskus õppida minevikust, küll aga on see kirjas gümnaasiumi õpitulemustes. Esiaja ja üldajaloo õpitulemused ning õppesisu vajavad tänapäevastamist ja teabe uuendamist lähtuvalt arheoloogia eesmärkidest.

Õpikuid, nii paberkandjal kui ka e-õpikuid, analüüsiti riiklikust õppekavast ja arheoloogia eesmärkidest lähtudes. Tähelepanu pöörati nii sisule, eakohasusele kui ka pildimaterjalile. Analüüsis kasutati erinevaid pedagoogikaalaseid uurimusi, näiteks professor Jaan Miku õpiku kirjutamise käsitlust, dr Falk Pingeli raamatut "UNESCO Guidebook on Textbook Research and Textbook Revision" (1999, 2010), Dual Codingi teooriat illustatsioonide analüüsis ja e-õpikute puhul teost "Best European Learning Materials Awards".

Avita ja Maurus on kaks Eesti kirjastust, mis annavad välja ajalooõpikuid. Avita õpiku "Eesti ajalugu" I muinasaja osa on kirjutanud arheoloogid, Mauruse õpiku on koostanud etnoloog ja ajaloolane, millest tulenevalt leidub muinasaja osas teaduslikult mittetõestatud infot ning tõlgendusi. Mauruse õpik vajab muinasaja osas täiendusi. Nii Avita kui ka Mauruse kirjastuse õpikutes on illustreerivat materjali (vt tabel 4). Mauruse õpiku "Eesti ajalugu" I pildimaterjal on kesine ja ei täienda teksti, seevastu Avita kirjastuse õpiku illustratsioonid võimaldavad allikaanalüüsi ning aitavad õpilastel interpreteerida muinasaegset ühiskonda.

E-õpikud on kasvav suundumus, mida Avita ja Mauruse kirjastus arendavad ning populariseerivad, mistõttu analüüsitakse õpikute võimalusi eraldi, kuigi sisu on neil paberõpikutega peaaegu sama. E-õpikute juurde on võimalik tekitada mitmeid tehnilisi lahendusi, mis parandaksid õpitulemuste saavutamist, näiteks arheoloogilistest esemetest võiks luua 3D-pildid ja animatsioonid ning lingid muuseumidele, artiklitele jne. E-õpikuid saab kergemini uuendada ja täiendada, mis võimaldab sisu pidevalt tänapäevastada.

Ajaloo- ja ühiskonnaõpetuse koolituse, gümnaasiumi riikliku õppekava ning õpikute analüüsist lähtudes saab öelda, et arheoloogiat õpetatakse koolides Eesti ajaloo ja üldajaloo kursuste raames. Arheoloogia mahtu õppekavas ei pea suurendama, kuid seda tuleb efektiivsemalt käsitleda. Õppekava tuleb tänapäevastada arheoloogia eesmärkidest ja teadusmaastiku uuendustest lähtudes. Muutma peab Eesti muinasaja ja üldajaloo vanaaja õppesisu ja õppe-eesmärke ning õpioskusi, see omakorda võimaldaks õpiku autoritel paremaid õpikuid kirjutada ja õpilastel paremini õpieesmärke saavutada ning oskusi omandada.