

# How is chronological thinking tested?

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Chronological thinking is an indispensable tool to structure a historical narrative and to give meaning to a sequence of events. It is not a natural skill, so the conscious inclusion of tasks stimulating that skill in teaching is crucial. It is important to appropriately test students' chronological skills by means of well-constructed examination tasks administered at the conclusion of subsequent stages of education. The authors discuss tasks that assess chronological thinking included in contemporary exam papers in Finland, France, the Netherlands, Russia, the USA and the United Kingdom. The tasks included in Polish arts and humanities exam papers at the lower secondary school level in the years 2002–2011 and the first history paper (2012) are then analysed. The final section presents the results of a survey to test the chronological thinking of lower secondary school students carried out by the Educational Research Institute.

KEYWORDS: history, chronology, chronological thinking, lower secondary school exam, history teaching, lower secondary school.

## What is chronological thinking?

Chronology is usually identified as the defining feature of history as compared with other social sciences. It governs historical narrative and gives an appropriate dimension to the issues discussed, enabling the proper perception of causal relations (Warring, 2010). Without chronology a set of events would be meaningless since both singular events and large-scale

processes can only be properly interpreted if appropriately “placed” on a time line, i.e. put in a broader context. Thus, it must be emphasised that chronological thinking, one of the major features of historical reasoning (Baker, 1995; Rick, 2011), is not only restricted to knowledge of dates. As noted in the literature, the concept also covers the following:

- distinguishing between the past, present and future;

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- identifying temporal structure in a historical narrative;
- introducing temporal order to student's historical narrative;
- measuring and calculating calendar time;
- creating a time line;
- interpreting data presented on a time line;
- explaining change and continuity;
- comparing alternative periodisation models;
- distinguishing eras and periods by capturing their characteristic features – intuitive awareness of time.

The first seven components of chronological thinking were identified in 1996 at the National Center for History in Schools; their interpretation is frequently cited (Spendel, 2005; Westhoff and Polman, 2008). The last two components are based on the findings of Polish authors (Bondaruk, 1989; Spendel, 2005).

The importance of chronological skills to enable historical reasoning requires their teaching to be part of the educational process from the beginning. Despite the abstract nature of historical reasoning, research in many countries suggests that even the youngest children understand the concept of time and can distinguish past and present, especially with issues of social history (Hoodless, 2002; Levstik and Burton, 1994; Şimşek, 2007). Equally, development of chronological skills at primary school is necessary to obtain the results desired later at higher educational levels. The need to develop these skills arises from the fact that their development is neither a natural process, nor the result of child psychological development (Dawson, 2007; Wineburg, 2001).

In the 19<sup>th</sup> century European model of instruction, chronological skill was regarded as knowledge of the dates of specific events. Assessment was therefore focused mainly on memorisation of these facts. The work of John Dewey (Dewey, 1967) initiated breakthrough in the teaching of chronology and the emergence of progressive education. The importance of learning through acting and

development of reasoning was emphasised, as well as teaching based on student problem solving. Educational philosophy during the Second Polish Republic was influenced by this approach (Dutkiewicz, 1978; Knapowska, 1978).

After World War II, historical materialism had a significant impact on the perception of chronological skills in the countries controlled by the Soviet Union. Understanding the dialectics of change was considered to be an important skill. The French *Annales* School changed the approach to chronological skills in the 1950s. Introduction of the concept of “long duration” enriched the teaching of history with the history of regions and social groups, requiring a new approach to the study of chronology.

Influenced by the *Annales* School, a critique of the traditional, fact-based teaching of chronology spread to other countries. Interdisciplinary problem-focused teaching was introduced and organised around specific social, economic and occasionally political issues. In history classes increasing focus was placed on seeking explanations for current phenomena and events. This involved looking for the source of problems and relations between the past and present – applying so-called reverse chronology (Finkel, 1974; Misco and Patterson, 2009), at the expense of linear presentation of history (the UK, some states of the USA). However, the movement away from the chronological approach also gave rise to some criticism. The related problems were highlighted by the report of the Fordham Institute, an American institution that examines the quality of education; “Since social studies are a mix of several disciplines, and because social studies standards are organised according to themes or strands rather than content or chronology, teachers and students fail to grasp, why history unfolded as it did” (Thomas B. Fordham Institute, 2011).

To avoid these pitfalls, attention is now placed on learning the skill of source analysis and comprehension. Basic dates and

landmark facts serve as the necessary comparative material needed for drawing conclusions and creating an independent synthesis. In practice, the model and the chronological skills expected are given by the core curriculum and external final exams. These signal the instructions to teachers. The tasks included in exam papers indicate which of the above-mentioned components of chronological thinking are considered key. They also signal to teachers which aspects of development of chronological skills are of particular worth in the teaching process.

Increasing the importance of history teaching in lower secondary schools by introducing separate history and civic education examinations in 2012 stimulated the History Section of the Educational Research Institute to investigate the place of chronology in lower secondary education. In particular, the exam papers of the Central Examination Board (*Centralna Komisja Egzaminacyjna* – CKE), published after the change of exam formula, were scrutinised. Methods used for testing chronological skills in Poland and in other countries are first briefly reviewed.

### **Testing chronological skills in selected countries**

Chronological skills constitute a central element in the educational systems of many countries and are the foundation for development of historical thinking. The similarities and differences in approach to their formation and assessment can be analysed by comparison of history exam papers for similar age groups. For purposes of analysis, exams taken by students around the age of 15 in England, France, Finland, the Netherlands and Russia were selected. These countries are representative for the various methods used for teaching history. Beyond the traditional approach to chronology, in which knowledge of dates from military and political history is tested, attempts to examine more complex

chronological skills can be found. Differences occur in form of the exam. Chronological skills are tested using closed tasks and also with open questions.

In the United Kingdom a non-compulsory exam at the end of history teaching in secondary education is taken by students generally aged around 16 (General Certificate of Secondary Education). Independent private companies are responsible for development of exam papers and although there is no single exam paper compulsory for the whole country, papers are relatively similar. Examinations are comprised of two parts: written assignments prepared independently at home and a paper of open questions relating to the topic of the essay (students can choose among over a dozen topics concerning various eras, e.g. the military orders in the Latin East in the 12<sup>th</sup> century or the French Wars of Religion; Assessment Qualifications Alliance, 2008). Students are only obliged to master the topics they select. In the exam, their task is usually to independently compile information from various sources which is the basis for a broader reflection on a given phenomenon, process or event. The exam in this form is mainly the composition of a narrative that is coherent, logical and embedded in the historical context. Emphasis is placed on the components of chronological thinking, such as introduction of a temporal order to one's own historical narrative and explanation of change and continuity in time.

Finnish students have to manifest similar skills at the end of their compulsory education (at the age of 16). The test they take contains 10 open tasks concerning various issues and historical eras – from ancient to contemporary history (Ylioppilastutkinto-Lautakunta, 2012). Some have the form of open questions (such as: “What was the impact of the French Revolution on the emergence of various ideologies in Europe at the turn of the 18<sup>th</sup> century?”; task 3). Others are accompanied by source materials in the form

of iconography or text (task 5). Chronological skills are checked in all tasks. There are no questions which only assess chronological skills. Most importantly students have to demonstrate complex chronological skills which enable construction of a logically coherent essay (e.g. indication of the relations of precedence, concurrence and succession, locating events in a broader temporal context).

It should be pointed out here that chronological skills are not assessed in all countries where the exam contains open questions. A good example is the French *Diplôme national du brevet* exam, taken by students aged 14–15 at the end of the *collège* (lower secondary school). During the exam, history is taken together with geography and civic education (Ministère d'Éducation Nationale, 2012). In reality, it is possible to omit the history topic and only select tasks concerning geography (mostly human geography which is close to history). Among the requirements faced by examinees, the key assignment is to master the “fundamental knowledge constituting the basis for historical, geographical and civic culture, expected at the end of school education” (Ministère d'Éducation Nationale, 2012). Each year exam tasks dedicated to history focus around one issue, e.g. in 2010 they exclusively concerned the Vichy Regime (Brevet des Collèges, 2011). Basing on specific sources, students answer questions – e.g.: “Why was the Vichy Regime not a democratic one?” (arguments should be taken from texts, such as a legal act from that time) or “Who are the two figures shaking hands in the photo (Marshal Pétain and Hitler) and what is the political meaning of that gesture?”. Answering the questions requires the ability to analyse and interpret sources and reasoning, while chronological thinking enables students to place a given source in the right historical context.

In the Russian exam taken by 16 year olds after nine years of education (the GIA exam – *Gosudarstvennaya itogovaya attestatsiya*) the emphasis is different. The instructions

for one part of the paper explain that the tasks are “to check the basic level of preparation – knowledge of dates, facts, concepts and terms, important historic events, the causes and outcomes of events; the ability to find information in sources” (Federalny Institut Pedagogicheskich Izmierenii, 2011). As defined in the paper specification, predominantly testing focusses on knowledge of the history of Russia, taking international history into account, especially that which is connected to Russian history. Issues related to wars are in the foreground.

An analysis of the content of the exam papers confirms that specific emphasis is placed on Russian military and political history. Questions primarily concern military leaders, battles, the history of czarism and the communist party. In one example, based on an extensive excerpt from a historical study on the engagements between Moscow and the Tatars, the student is asked: “Which encounter is discussed here? Identify the year of the event. What was the outcome?” In this case, the tasks that refer to chronology require provision of specific dates. Students are asked directly to state the year in which the USSR was established, to match dates to events, such as the organisation of the Olympic Games in Moscow, adoption of the Constitution of the Russian Federation or the first flight of man in space. Besides knowledge of dates, the exam also assesses the ability to make time lines. Students are asked, for instance, to arrange five people in the right order or identify two events related to the Revolution of 1917 (1. the transition to new economic policy; 2. abdication of Nicholas II; 3. the Kronstadt rebellion; 4. establishment of temporary authorities; 5. the Battleship Potemkin uprising).

Similar questions assessing the ability to create time lines and requiring the students to use their knowledge also appear in the Dutch exam *Hoger algemeen voortgezet onderwijs* (HAVO), taken by students at the age of 17. The exam papers are complex. Over a dozen

sequential tasks are focused around one problem which allows assessment of several historical skills (Examen HAVO, 2011). The papers from 2011 concerned only two issues: the first section was “Dynamics and stagnation in the Republic” (tasks 1–14), mainly addressing economic problems. The latter section concerned “De-colonisation and the end of the Cold War in Vietnam” (tasks 15–29). One of the questions required students to sequence six items about the Dutch economy. In another task students were first expected to read a text about a merchant and select those concepts related to the Golden Age of the Republic that best matched the episodes from the merchant’s life. Therefore, students were expected to answer in accordance with the pattern: “concept ... matches ... (year and event from the life of the merchant), because ...”. Two aspects of history are paired in this sentence; changes at a national scale are linked to changes in the life of an individual. In this way the question activates general historical knowledge by reference to the life of an individual. History becomes accessible and less abstract and so, more interesting.

The above review of state exams primarily shows the variety of methods used to test chronological skills. The differences lie both in the tradition of history teaching and the form of the exam which is often determined by technical limitations. Keeping these factors in mind, it should be noted that the tasks that require students not only to demonstrate knowledge but also to use it, enable development of chronological skills which can be the starting point for in-depth historical analyses.

### **Assessment of chronological skills in Poland in 2002–2011**

The exam taken at the conclusion of lower secondary level in 2002–2011 was in two major parts. One section devoted to arts and humanities and the other to maths and science, plus a third foreign language paper. In

terms of form, it resembled the upper secondary school leaving exam and was administered throughout the country as a uniform exam paper prepared by the CKE. In arts and humanities, beside the dominant tasks concerning Polish language, there were questions about history and civic education. In 2002–2003, the exam did not contain tasks assessing chronological skills. In subsequent years, mainly the ability to place events in time was assessed. Students were first to familiarise themselves with the source material, to interpret it, and then indicating appropriate dates or time periods. The difficulty of tasks was varied. There were also tasks which required direct responses providing the date of a specific event, e.g. the paper of 2009 asked the students to identify the date of the November Uprising (CKE, 2009, task 16). Basic chronological skill was also assessed by one task in 2008, in which students had to indicate the turn of century, when Boleslaus the Wry-mouthed grew up, using his dates provided in a footnote (CKE, 2008, task 13). The student’s role was only to match dates to the appropriate centuries. The task was successfully answered by 80% of students. In 2011 there was a task which required the ordering of events surrounding the fall of the First Polish Republic and was based on provided source material (CKE, 2011):

#### Task 4.

The chronological order of events from the years when the historical figures referred to in the text “The Manor House in Soplicowo” lived is as follows:

- A) Adoption of the Constitution of May 3; outbreak of the Kościuszko Uprising; Second Partition of Poland.
- B) First Partition of Poland; outbreak of the Kościuszko Uprising; adoption of the Constitution of May 3.
- C) Outbreak of the Kościuszko Uprising; adoption of the Constitution of May 3; Third Partition of Poland.

- D) First Partition of Poland; adoption of the Constitution of May 3; outbreak of the Kościuszko Uprising.

It should be noted that beside the ability to place events on a time line, such a task structure assesses causal reasoning without requiring the knowledge of specific dates. Solving such a task is easier for a student who thinks in terms of historical processes, i.e. perceives interdependencies of specific events. In the 2006 exam paper, students were asked to arrange events from contemporary history in order in the same way (the fall of the Berlin Wall, Polish accessions to the NATO and the European Union; CKE, 2006, task 19). In this example students were able to use their memory to some extent, as some events had taken place during their lifetime. At this point, the huge disproportion in resolution of the two tasks should be emphasised. The earlier example, concerning events from the end of the 18<sup>th</sup> century, was correctly answered by only 26% of students. The second example about accession to NATO was answered correctly by 80%.

Tasks examining chronological skills in the context of analysis and interpretation of source materials appeared in the exam papers for the first time in 2004. One task based on a longer text devoted to fashion asked students about the war years (CKE, 2004):

Task 11.

During the Nazi occupation, wearing boots signified sympathy with the underground organisations. The word occupation used above refers to the period:

- A) 1914–1918.
- B) 1939–1945.
- C) 1945–1956.
- D) 1968–1989.

The key to solving the task was to understand the term “Nazi occupation” and refer it to the years 1939–1945. In 2005 those sitting the examination were asked to read a fragment of Samsonowicz’s article on the Congress of Gniezno and then to indicate which period the

text was referring to: Medieval, Renaissance or the Enlightenment (CKE, 2005, task 1).

Another example of placing events on a time line based on source analysis and interpretation comes from the 2006 paper. This time, the students had to determine the date of the creation of a certain satirical drawing. Based on the text: “We have defeated the communist regime, we are in NATO, we have entered the EU, the whole world admires us, and he is talking about an ordinary pipe...” spoken by one of the figures drawn, students were asked to identify the earliest time when the drawing could have been created, selecting from the dates: 1989, 1990, 2004, 2005 (CKE, 2006, task 19). The task referred to contemporary events which most students could answer without much difficulty. The task was successfully answered by more than 70% of students.

Only once, in 2011, did the exam assess students’ ability to “introduce temporal order into their own historical narrative”. Referring to knowledge of events during the Poles’ fight for independence, students were asked to indicate, whether Tadeusz Kościuszko, Jan Henryk Dąbrowski and Józef Piłsudski deserved to be called patriots (CKE, 2011, task 22). Instructions emphasised that the time of events described should be taken into account. The example answer showed that appropriate dates should be provided. Three lines were provided to write each person.

An analysis of papers used in the arts and humanities part of the lower secondary school leaving exam in the years 2002–2011 reveals that what was predominantly assessed in that period, was the ability to place events on a time line (or to create it). The other components of chronological thinking were assessed much less frequently. Experience of chronological tasks had developed the belief, in both students and teachers, that chronological thinking primarily involves placing events in time. Tasks, whilst differing in form, were basically built around the question: “When did it happen?”

### **Chronology in the core curriculum**

In the new history core curriculum, at each stage of education, the first general requirement concerns chronology, which emphasises its importance in history education in Poland. Students' chronological skills are expected to develop gradually at subsequent stages of education:

- Primary school: "The student can use the basic historical time expressions (BCE, CE periods, millennium, century, year). Matches historical facts to dates. Calculates time between historical events and places them on a time line. Recognises links between the present and the past".
- Lower secondary school: "The student places historical events, phenomena and processes in time, as well as orders them and establishes the relations of precedence, contemporaneity and succession. The student recognises changes in the social life and continuity in the development of culture and civilisation".
- Upper secondary school: "The student orders and synchronises events from world and Polish history. The student recognises the variability and dynamics of events in history, as well as continuity of historical processes" (MEN, 2008).

The requirements for specific educational stages correspond to the most important components of chronological thinking. In Polish history education, development of reasoning in terms of historical time already starts at primary school, where simple skills are taught (differentiating between the past, the present and the future; measuring and calculating calendar time). At the same time, the foundations of more complex skills are developed. These are further expanded at subsequent stages of education (identification of the temporal structure of historical narrative; introduction of temporal order to own historical narrative; time line creation; intuition about time – distinguishing

between eras and periods by capturing their characteristic features; interpreting the data presented on a time line). As regards the components introduced to lessons at lower secondary school, they are further developed at upper secondary school (explanation of change and continuity in time; comparison of alternative periodisation models). This is also consistent with the postulates reported in international literature dedicated to the principles of designing the instructional process (Gagné, Briggs, and Wager, 1992).

The requirements forming the second part of the core curriculum are in the context of historical analysis and interpretation skills, historical narrative creation alongside chronological skills. The general requirements highlight the necessity to order and place landmark events and processes, e.g. the student "places in time and compares the systems of government and organisation of the society in Sparta and Periclean Athens"; "orders and places in time the most important events concerning the relations between Poland and the Teutonic Order in the Jagiellonian Era"; "evaluates the character of the political changes in the Polish Republic in the 17<sup>th</sup> century" (MEN, 2008).

The current core curriculum, which also sets the exam standards, places huge emphasis on development of broadly understood chronological skills. Comparison of its provisions with the exam tasks enables verification of the importance attributed to the development of those skills by the education system.

### **Tasks assessing chronological thinking skills**

Introduction of a new core curriculum was accompanied by a change to the existing form of the lower secondary school leaving exam, dividing the former arts and humanities part into separate exam papers, the first one covering Polish and the second history and social science. Now each student graduating from

the lower secondary school takes an exam, the principal aim of which is to assess students' historical skills. It might be asked, whether the formal changes significantly affected the method of assessing the chronological skills of lower secondary school students. So far, the CKE has published three sets of tasks: a model set in October 2011 (CKE, 2011b), a mock exam paper in December 2011 (CKE, 2011c) and the actual exam paper of April 2012 (CKE, 2012). All sets featured tasks addressing chronology and the analysis of students' performance revealed some regularities.

Demands on the student to know specific dates were reduced, although knowledge of such "hard facts" may help in solving the tasks, but as emphasis is placed on the ability to construct proper time series and sequences of events, they are not always the factor determining success. In each exam paper published by CKE students were asked at least once to identify the first and last events, as in task 7 from the October paper, where the choice was between: the Union of Krowo, the Prussian Homage, the Thirteen Year's War and the Battle of Grunwald, i.e. events strongly based on point 15.2 of the core curriculum detailed requirements. Solving such tasks requires the student either to know the dates of all listed events, or to analyse the causal relations between them.

Just as frequent were tasks in which students had to identify the answer containing chronologically ordered historical events. For instance, one task was to indicate the correct order of organisation of social life (nomadic, emergence of agriculture, creation of state; CKE, 2011b, task 1). In this example, students could answer correctly, if they realised that the emergence of agriculture had to be related to adoption of a sedentary lifestyle and the state could not be created without the development of agriculture. Again, perception of causal relations was helpful. Tasks of this kind require looking at history not only as a set of singular events but also a sequence of social transformations.

In other tasks, the CKE expected the students to identify subsequent periods in the history of culture (CKE, 2011c, task 8) or events related to geographical discoveries (CKE, 2012, task 11). The ability to place some events in the context of others is assessed by instructions taking a more traditional form. In one task the students were asked to select events from those provided, which took place after the Third Partition of Poland (CKE, 2011b):

Task 15.

Finish the sentence, selecting the correct answer from those provided below.

After the Third Partition of Poland:

A) the Polish Legions were formed.

B) the Great Sejm was held.

C) Stanisław Poniatowski was elected.

D) the Targowice Confederation was established.

Again, one way answer correctly required critical analysis and placement of the events in time, rather than possessing absolute knowledge of their dates.

Tasks using the chronology band are a popular form of checking chronological skills. On the band, students are to identify the time period within which a given event or process occurred. In task 1 of the April exam paper (CKE, 2012), the students were additionally asked to read information from a map (the Neolithic culture emerged in Egypt before 4000 BCE, but after 5000 BCE), and then indicate the right time range on the time line, on which subsequent millennia were marked. The task required, therefore, not simply the knowledge of a specific event but reaching a conclusion that if the event took place before 4000 BCE and after 5000 BCE, it took place in the 5<sup>th</sup> millennium BCE. Development of that type of skill is included in the core curriculum for the 2<sup>nd</sup> stage of education (primary school): "The student is familiar with basic descriptions of historical time: BCE, CE periods, millennium, century, year". Similar skills were required in task 2 from the December paper: students

were asked to indicate in which half of which century first Olympic Games took place.

The knowledge of two key dates for important periods in Polish history was tested in an interesting way. In the April paper (CKE, 2012), students were asked to identify the rulers of the occupying countries in power when the Third Partition of Poland took place:

Task 14.

Finish the sentence – select the right answer from those provided below.

Monarchs responsible for the Third Partition of Poland included:

- A) Frederick II the Great and Maria Theresa.
- B) Frederick Wilhelm III and Catherine II.
- C) Catherine II and Frederick Wilhelm II.
- D) Paul I and Joseph II.

The stimulus material for the task was a table showing dates of sovereignty for rulers, their predecessors and successors. The student, therefore, had the information to identify the date of the last Partition of Poland. The October paper (CKE, 2011b, task 12) required identification of the period in which the first free election took place on the chronology band. It should be noted that not only do both dates required from the students belong to the canon of historical knowledge, but they are also firmly set in the detailed requirements of the core curriculum, which means that the creators of the exam placed emphasis on the knowledge of the most important facts that structure this historical knowledge.

Analysis of tasks proposed by the CKE to assess chronological skills allows proof of the types chronological thinking. Two types of tasks can be identified. Most of them require students to create time lines, ordering events, indicating the first or last event, or selecting an appropriate range on a time line. It should be stressed, however, that solving some of the tasks also requires ability to interpret data presented on a time line. Both skills have already emerged at primary school level to be developed in lower secondary school.

The second group of tasks, requiring students to demonstrate measurement and calculation of dates, are less frequent. The CKE does not assess many aspects of chronological thinking shown above, e.g. identification of temporal structure in historical narrative, introduction of temporal order to historical narrative, explanation of change and continuity in time, comparison of alternative periodisation models, discrimination of eras and periods by understanding their characteristics. The closed form of the exam would make it difficult to test some requirements of the core curriculum (e.g. introduction of temporal order to the student's own historical narrative or explanation of change and continuity in time). However, it is easy to envisage tasks that would assess students' ability to compare alternative time models or identify the temporal structure in a historical narrative.

#### **Chronological skills of students in the study *Diagnoza kompetencji gimnazjalistów 2011***

Using the opportunity provided by the mock lower secondary school exam (7–8 December 2011) the Educational Research Institute carried out a study *Diagnoza kompetencji gimnazjalistów 2011* (Diagnosis of the competences of lower secondary school students 2011 – DKG) to find out how students cope with chronological thinking tasks. The survey covered 6869 students from 80 selected schools. The aim was not only to assess students' historical skills but also to characterise the implementation of the new core curriculum and improvement of student assessment. The study used CKE's exam the reliability of which as measured with Cronbach's alpha was 0.74 (IBE, 2012). The paper contained four tasks requiring students to demonstrate chronological thinking. The first required measuring and calculating time (Task 2) whilst the other three examined the ability to create time lines (Tasks: 6, 7.1 and 8).

## Task 2.

Finish the sentence by selecting the answer from those provided below.

The first Olympic Games took place in 776 BCE, that is in:

- A) the 1<sup>st</sup> half of the 7<sup>th</sup> c. BCE.
- B) the 2<sup>nd</sup> half of the 7<sup>th</sup> c. BCE.
- C) the 1<sup>st</sup> half of the 8<sup>th</sup> c. BCE.
- D) the 2<sup>nd</sup> half of the 8<sup>th</sup> c. BCE.

The task verifying ability to determine time of a provided date proved to be one of the most difficult, although students interviewed after the test evaluated the exercise as very easy. Only 25% selected the correct answer, 55% selected the wrong half of the century and the remaining 20% misidentified the century. According to analysis, students found this exercise difficult regardless of ability. Students found measuring and calculating calendar time difficult whilst it should have been covered during the 2<sup>nd</sup> stage of education. The remaining three tasks assessed interpretation of time lines in various ways. Students were asked to order events, eras or rulers chronologically.

## Task 6.

Of the events provided below, marked with letters A–D, select the event chronologically first and the event chronologically last. In the table, check the letters which mark selected events.<sup>1</sup>

6.1. Event chronologically first	A	B	C	D
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6.2. Event chronologically last	A	B	C	D
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- A) Baptism of Poland.
- B) Congress of Gniezno.
- C) Death of Mieszko I.
- D) Coronation of Boleslaus the Brave.

The task did not check knowledge of specific dates or the ability to identify sequences, precedence and succession. All events referred to the early Piast rulers. Identification of the earliest event was much easier than the choice of the last one. The Baptism of Poland was identified correctly by 78%, while the last event (the coronation of Boleslaus the Brave) was identified by fewer respondents (65%). The Baptism of Poland is taught in history lessons as the event that initiated every sequence of events from the period of early Piast rulers. Yet in both cases (6.1 and 6.2) the most frequently selected distractor was the Congress of Gniezno (in the first part, it was selected by 11% of students, and 17% in the second). This event was selected by students who, not knowing the correct answer decided to chose the option that sounded most familiar. It should be pointed out that the most chronologically distant event was the least frequently chosen in either case. This may indirectly testify to better acquaintance with events related to the beginnings of the Polish state which are less easy to confuse than in later history.

<sup>1</sup> The parameters of the first part of the task in the Classical Test Theory (*Klasyczna Teoria Testu*, KTT, c.f. Jakubowski and Pokropek, 2009): easiness 0.78; item-test correlation: 0.33; parameters of the three-parameter Item Response Theory model (hereinafter the IRT, c.f. Jakubowski and Pokropek, 2009): pseudo-guessing 0.62; difficulty: 0.31; discrimination: 1.95; parameters of the second part of task in the KTT: easiness 0.65; item-test correlation: 0.4; parameters in the three-parameter IRT model: pseudo-guessing 0.4; difficulty: 0.32; discrimination: 1.64. The CKE gave 2 points for that task, but that decision gives rise to some doubts. Such grading makes us reward or punish students twice, checking each time

the same requirements of the core curriculum concerning chronology of events during the reign of the two first rulers of Poland. Using statistical tools, we may carry out a simulation of how the parameters of the discussed task change in the case of awarding 1 point for both activities. It turns out that with such grading, the parameters of the discussed task would become better. The parameter of pseudo-guessing would go down to a good level (0.25), and the task would become more difficult (0.43) with maintaining a high discrimination parameter (1.51). It means that such a task would better differentiate between students, giving, at the same time, a smaller likelihood of scoring a point for weaker or "guessing" students.

## Task 7.

Complete the text by matching each sentence to the correct answer from those provided below.<sup>2</sup>

Casimir the Great became the king of Poland in the year of the death of 7.1. \_\_\_\_\_. Thanks to diplomatic endeavours of Casimir the Great, the king of Bohemia 7.2. \_\_\_\_\_. Casimir the Great concluded an agreement concerning ascension to the throne with 7.3. \_\_\_\_\_.

7.1.	A. Mieszko II	B. Boleslaus the Wry-mouthed	C. Ladislaus the Elbow-high
7.2.	A. gave town charter to the city of Cracow	B. rescinded his rights to the throne of the Kingdom of Poland	C. took the Gdańsk Pomerania from the Teutonic Order
7.3.	A. Lithuanians	B. Russians	C. Hungarians

However, chronological ordering of the rulers of Poland may be more difficult. This is reflected in the results to part of task 7 in which the ruler in power before Casimir the Great was to be identified.

The task was surprisingly difficult. Only 37% of students correctly identified the father of Casimir the Great, the same number chose Boleslaus the Wry-mouthed and distractor A convinced as many as 26% of the respondents. Such a distribution of results indicates that students may find it really difficult to correctly order rulers, even if the proposed figures are far removed in time. It suggests that some students are not able to independently determine the right chronological order based on key events. The results indicate that a large group of students do not link Boleslaus the Wry-mouthed with the beginning and Ladislaus the Elbow-high with the end of regional division. In addition, students who obtained the best results in the test coped rather well with that task. Similar conclusions are drawn from the analysis of the next task.

Task 8 had the form known from other papers published by the CKE in 2011 and 2012. Based on the knowledge of the sequence of eras in culture the student was to identify the correct chronological sequence.

## Task 8.

Finish the sentence, selecting the best option provided below.<sup>3</sup>

The series in which periods in the history of culture are ordered chronologically, is:

- A) Baroque → Renaissance → Enlightenment.
- B) Renaissance → Baroque → Enlightenment.
- C) Baroque → Enlightenment → Renaissance.
- D) Enlightenment → Renaissance → Baroque.

It is another task which proved unexpectedly difficult: the correct answer (B) was selected by just 38% of students. The students clearly preferred options in which the Enlightenment was at the end of the series (answer A was selected by 37% of respondents). The two other distractors were chosen much less frequently, although they were not unattractive to students: options C and D were chosen by 13% and 12% of students respectively. Thus, it seems that what made the task difficult to solve was the need to decide which of the Baroque or Renaissance periods was earlier. The results show that students are not able to properly reconstruct the time line representing the history of culture.

Based on analysis of the above three tasks, we may conclude that students have problems with ordering events and perceiving the sequence of precedence and succession. None of the tasks quoted above used the chronology

<sup>2</sup> The parameters of the first part of the task in the KTT: easiness 0.37; item-test correlation: 0.37; parameters in the three-parameter IRT model: pseudo-guessing 0.24; difficulty: 1.26; discrimination: 2.05.

<sup>3</sup> Task parameters in the KTT: easiness 0.38; item-test correlation: 0.33; parameters in the three-parameter IRT model: pseudo-guessing 0.28; difficulty: 1.43; discrimination: 2.09.

band as a graphic representation of such sequences.

Therefore, for greater confidence in the reasoning one should refer to the results of the survey carried out by the History Section of the Educational Research Institute. In one of the tests in different parts of the paper there were two tasks requiring the date of the First Partition of Poland.<sup>4</sup>

The first task was a traditional, straightforward question concerning the date of a specific event (the First Partition). The second task described an event in a short text (“in 1754, the chancel of the church was destroyed”) requiring the event to be placed on a time line. Knowledge of the date was essential to solve the task. While 76% of the students correctly answered the first task, only 44,5% placed the date correctly on the time line in the second task – 26% of respondents marked the second range on the time line, 19% the third and 9% the fourth. The task proved difficult, although the time line comprised events specified by the core curriculum and were, therefore, taught at school. Based on the responses to the first task, these dates were familiar to students. It must be concluded from the task, that even if students know a specific date, they may find it difficult to make use of that knowledge in practice. The conclusion is also confirmed in the analysis of the results of similar tasks.

#### Task 4.

In which year was the treaty of the First Partition of Poland signed?<sup>5</sup>

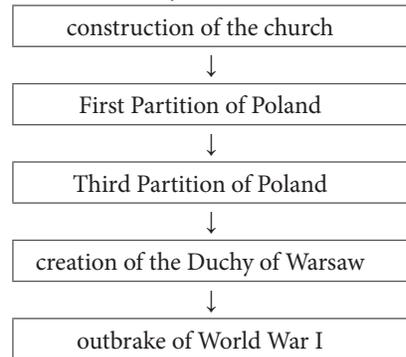
- A) 1717
- B) 1772
- C) 1793
- D) 1795

<sup>4</sup> Test reliability measured with the Cronbach's  $\alpha$ : 0.80; sample of 463 students of lower secondary school grade three.

<sup>5</sup> Task parameters in the KTT: easiness 0.76; item-test correlation: 0.35; parameters in the three-parameter IRT model: pseudo-guessing 0.00; difficulty: -1,51; discrimination: 0.87.

#### Task 33.

Identify the period in which the chancel of the church was destroyed.<sup>6</sup>



The analyses revealed that regardless of type, the tasks assessing chronological thinking yield poor results. The best and the weakest students alike experienced difficulty.

### Summary

Lower secondary school students are challenged by simple tasks assessing their knowledge of the most important dates. The way that this knowledge is assessed in Polish schools may explain this phenomenon. However, the fundamental concepts required for chronological thinking, such as creation and analysis of a time line, measuring and calculating dates are also sometimes a challenge. Lower secondary school students have difficulty in sequencing events and are frequently unable to solve problems that require more sophisticated chronological skills. Even when students can demonstrate the prerequisite knowledge, they are unable to use and interpret it to solve problems. Therefore, it is logical to conclude that a change to the methods of teaching chronological skills is needed in the classroom. The key to change

<sup>6</sup> Task parameters in the KTT: easiness 0.445; item-test correlation: 0.41; parameters in the three-parameter IRT model: pseudo-guessing 0.18; difficulty: 0.77; discrimination: 1.36.



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