

Article

# Who Supports Polish Educational Reforms? Exploring Actors' and Observers' Attitudes

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**Abstract:** This investigation is based on eight extensive empirical studies (total  $N = 12,294$ ) supplemented by automated analysis of online data, to examine attitudes toward educational reforms introduced in Poland in 2017. We explore the attitudes within groups categorized as actors (people directly affected by the reform, namely students and parents) and observers (the general population). The Attitudes Toward Educational Reform Scale (ATERS) was developed and validated. ATERS psychometric properties were examined using item response theory and confirmatory factor analyses, while the differences between groups were summarized meta-analytically. Consistently with expectations, we observed that the overall attitude toward the reform was negative, and the strength of this negative attitude increased along with being more directly affected by the changes introduced by it. While the general population held a relatively neutral attitude toward the reform, the attitude was clearly negative among parents and students. We discuss reasons and consequences of these findings.

**Keywords:** educational reform; attitude toward change; Poland; item response theory; ATERS



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## 1. Introduction

Although every decade brings new ideas for improving educational systems, teaching, and curricula [1–4], many scholars would likely agree that education is hard to change [5]. Indeed, school is being criticized as a place where students' creative thinking is stifled and perceived as a place that builds conformity [6]. At the same time, there is evidence that school education develops intelligence [7,8] and that school achievement is driven by students' creative skills [9,10]. So, even if educational systems should likely change to respond to the challenges of contemporary world more appropriately, it is hard to justify that this change should be revolutionary, as school critics sometimes postulate [6].

This article analyzes attitudes toward a particular educational change recently (2017) introduced in Poland—government-initiated, top-down reform of educational structure and curricula. The specificity of this situation, as we discuss in more detail below, is related to the highly political nature of the changes introduced and their justification provided for the public opinion by the ruling party. Therefore, the support or rejection of the reform in broader public opinion—the observers of the changes introduced, and the more engaged actors, namely parents and students themselves—is of particular interest. In a set of studies that we present below, we developed a brief measure to assess attitudes toward the reform and used automatized sentiment analysis to explore the emotional reactions of public opinion as presented in online sources.

In what follows, we briefly present the Polish educational system (the context of the study) and the main arguments supporting the recent reform as well as the main assumptions of the reform. We posit that exploring the attitudes toward the reform is of both scientific and practical importance. As Busemeyer and his colleagues argued [11], public opinion reactions toward educational reforms are clearly under-researched. In their comparative, cross-national (Germany, Italy, Spain, Sweden, UK, Denmark, Ireland, and France) investigation, they found that while there was substantial variability in opinions,

overall, there was also clear openness to reform observed across countries. They further provide rationale as to why it is important to take into consideration what citizens think about the changes proposed by politicians, as, if they are unconvinced by the politicians' plans, they tend to actively or passively reject it. Another study [12] has demonstrated that certain characteristics, such as educational background, but also being more or less engaged in educational discourse by having children, significantly differentiated the opinions presented. In this investigation, we continue this line of inquiry.

However, there is also a more general theoretical perspective that justifies analyzing what different kinds of actors and observers think about education. This perspective is probably best illustrated in the seminal works of Pinar [13] (see also [14,15]) with the notion of the necessity of all parties being engaged in the conversation about education. Indeed, as Pinar states: "Education is too important to be left to politicians and those parents who believe them" ([13] p. xiii). Importantly, from this perspective, all actors on the educational stage—students (see also [16]), teachers, and parents—are perceived as equally important and their voices should be heard to better understand the tensions and dilemmas associated with educational reforms' successes and failures. Too often, educational reforms are forced by politicians and it makes the main affected parties—particularly teachers and students—not only voiceless but also disengaged and apathetic ([13], p. 176).

Consequently, the school starts resembling a factory and "the factory-model school achieves social control at the cost of intelligence, intelligence broadly understood as including problem solving, critical thinking, and creativity as well as memorization and calculation." ([13], p. 28). Thus, participatory exchange of different actors' perspectives at the educational stage becomes critical for reforms' development and success.

### 1.1. *The Polish Educational System*

The Polish educational system witnessed two large-scale reforms in the last two decades [17] (see [18] for a comparative discussion of educational reforms in Central and Eastern Europe) and two other, less-pronounced reforms: curriculum and evaluation reform in 2007, and early education reform introduced in 2014 [19]. The first of the large-scale reforms, conducted in 1999, shortened primary education from eight to six grades and introduced a new type of school: a 3-year middle (or lower-secondary) school. Consequently, overall, compulsory education was extended from eight years before the 1999 reform (eight-year-long primary school) to nine years after it (six grades of primary school and three grades of middle school). Importantly, the changes were not only structural, although these were most intensively commented and criticized [20]. The reform also introduced two important elements. The first was standardized external exams that allowed for a more objective assessment of students' achievements and school qualities [21]. While criticized for overtesting [22], this change provided some arguments for further research and policy decisions. The other important change involved curricula modernization [23–25], especially the focus on problem-solving and cognitive abilities [24,26]. The changes introduced flexibility in curricula: before the reform (prior to 1999), each subject was taught from one textbook based on one syllabus. After the reform, only very general requirements were formulated, with the possibility to achieve them in various ways. This allowed teacher-introduced innovations [25] and gave more flexibility across and within schools.

These changes are considered one of the main factors that contributed to the substantial progress of Polish students in subsequent waves (2000–2015) of the Programme of International Student Assessment (PISA) study [21,27,28]. The first wave of the study, in which Polish 15-year-old students participated, was conducted in 1999—the participants were students unaffected by the reform. All subsequent waves included students of new middle schools. As illustrated elsewhere [27], not only was there linear growth in average scores obtained by students in subsequent waves of the study, but the number of lowest-achieving students was effectively reduced as well. Other studies [29] demonstrated that school achievement in middle schools was positively driven by incorporating students' creative abilities into the process of learning. All in all, apart from the critique of

standardized tests and the PISA study [30–32], these findings provide evidence that the reform was successful in developing students' problem-solving skills, knowledge, and creativity. Additionally, more distal positive effects of this reform were demonstrated as well. Graduates of post-reform Polish schools were more likely to be employed and earned higher wages [33]. Another analysis [34] provided slightly more nuanced results by demonstrating that this positive effect was observed only for male graduates.

### 1.2. The 2017 Educational Reform in Poland

Even though it was successful in terms of students' school achievement, the 1999 education reform was widely criticized. During the electoral campaign of 2015, opposition promised to restore the previous school structure, namely eight-year primary school, four years of high school, and liquidation of middle schools. This promise was indeed introduced very quickly after the opposition won the elections. Moreover, the speed of the changes introduced, altogether with a lack of consideration of public opinion, non-governmental organizations, and parents or teachers' unions, led to protests and growing skepticism among the public. Notably, the changes eventually introduced by the so-called "Law of Education" in December 2016 were associated not only with structural changes, but also substantial, yet not well-prepared, curriculum changes. This—among others—included a stronger focus on history and Polish language lessons, with extended syllabi. The previous solutions based on project-based learning and support for teachers' innovations were no longer encouraged [17]. The changes were perceived as highly chaotic by teachers: a lack of textbooks and an unprepared and not-consulted curriculum base created problems in their everyday school functioning.

Consequently, this led to a large-scale teachers' strike in April 2019. Although the official reason for the strike was salary raise, the main critique and postulates of teachers' unions were associated with the growing chaos and overloaded curriculum the reform introduced. There was an overall positive reception of the strike in the society [35]: while the opinions differed (44% of the respondents in a representative study supported the strike and 36% were against it), the support increased among people up to 44 years old (51%), from the biggest cities (62%), with university backgrounds (60%) and the highest income (60%). The strongest predictor of the attitudes toward the strike was political affiliation: while 60% of the supporters of the ruling party that introduced the reform were against the strike, almost 80% of the voters for the main opposition party supported the strike. Importantly, however, apart from the inconveniences the strike had caused (schools were closed), the support among parents was higher (50% supported the strike, 34% were against it) than in the rest of the society.

Overall, the changes of the 2017 reform were perceived as far-reaching, driven by the political promise made by the ruling party, yet not based on solid empirical evidence. It was instead an unspecific argument that schools (particularly middle schools) did not work well (despite the PISA results), and what was needed was a return to the "good old days" [17]. Ironically, when the PISA 2018 results were announced in December 2019, i.e., when the reform was ongoing, it became apparent that Polish 15-year-olds were still improving their outcomes, which gave them one of the highest positions in Europe, well-above the OECD average. However, the students who participated in this wave of the PISA were the last group of middle-schoolers. It is indeed ironic that such a highly successful school system was shut down. The results of the Trends in Mathematics and Science Achievement (TIMSS) study from 2019 demonstrated that although Polish fourth-graders results' were still above the OECD in math and science (520 and 531 points with an OECD average of 500), there was a statistically significant drop in their results in both these domains as compared to 2015. Governmental interpretations [36] linked this drop to the April 2019 teachers' strike (the fieldwork was conducted between April and May 2019, so shortly after the strike). These arguments were debunked by journalists and experts [37], who emphasized that students lost no more than eight school days due to the strike, and the real reason should rather be associated with the chaos caused by the quickly introduced, unprepared changes.

For example, when middle schools were shut down, there was a need to hold additional classes in primary schools, which quickly became overloaded. Similarly, the former middle school teachers had to move, and many of them started to teach in primary schools [37].

Given the far-reaching changes introduced, it seems both interesting and relevant to better understand the attitudes toward the reform. While general public opinion polls were conducted, their obvious limitation is the fact that such surveys very rarely include the voices of the most interested actors, namely students. Therefore, our goal in this investigation was two-fold. First, we aimed at integrating a series of extensive survey studies with the analysis of public discourse about the reform to investigate whether its evaluation in public opinion is positive or negative. Second, we were interested in potential differences in the observers of the changes introduced, so we considered the general public opinion and the two groups that were most strongly affected by the reform, namely parents and students.

## 2. Materials and Methods

### 2.1. Participants and Datasets

This investigation utilizes data from two primary sources: automated analysis of online data and a series of empirical studies on different populations. The automated analysis of online sources was conducted using sentiment analysis as provided by the internet monitoring service Brand24. Brand24 offers continuous monitoring of internet sources based on selected keywords and provides both a number of mentions daily and their automated sentiment analysis in terms of positive and negative emotions. We searched for five main keywords in Polish: “education(al) reform,” “education(al) deform,” “compulsory schools” (in Polish: “szkoły branżowe”), “middle schools disbanding,” as well as “Zalewska’s reform.” Available data covered a period of two years: from January 2018 to August 2020. As Brand24 uses automated sentiment analysis, to ensure its validity, a randomly chosen sample of 150 mentions was selected and coded for positive, negative, or neutral emotions by the first author of this paper, blind to Brand24 scores. Human-coding and computer coding consistency were sufficient to rely on automated coding ( $\kappa = 0.66$ ).

The second and the main source of data used in these analyses was a set of eight independent studies conducted on a total sample of more than 12,000 participants (total  $N = 12,294$ ), who reported on their attitudes toward the reform. We provide more details about both these approaches below.

#### 2.1.1. Studies 1–3 (General Population)

The first three studies were conducted on a sample drawn from a general population of adult Poles, therefore representative for the whole population of Polish citizens, aged 18 years old or older. All three studies were conducted online. Overall, across samples, there were 1479 men and 1532 women aged 18–75. Study 1 was conducted in December 2018, Study 2 in April 2019, and Study 3 in August 2019.

#### 2.1.2. Studies 4–5 (Parents)

Studies 4 ( $N = 1492$ ) and 5 ( $N = 235$ ) were conducted on samples of parents whose children were students directly influenced by the changes introduced—either seventh grade of elementary school ( $N = 805$  in total) or second grade of disbanded middle school ( $N = 915$ ). Participants in these studies were primarily mothers ( $N = 1459$ , 84%). Study 4 was conducted in September 2018, and Study 5 in December 2018.

#### 2.1.3. Study 6–8 (Students)

The last three studies were conducted on large samples of students ( $N = 5052$ ,  $N = 1168$ , and  $N = 1335$ , respectively). Study 6 consisted of students who varied in age ( $M = 17.03$ ,  $SD = 1.25$ , range: 11–18) and covered a substantial sample of students who were directly affected by the reform (i.e., students of the last grades of elementary schools and students of middle schools,  $N = 2759$ ). The remaining participants were primarily high school

students ( $N = 2014$ ). Studies 7 and 8 were conducted on samples of students who were directly affected by the reform and reported on their attitudes, while already being in high school. In both these samples, there were high school students who either graduated from disbanded middle schools as the last year before graduation (Study 7,  $N = 614$ , Study 8,  $N = 646$ ) or as the first year of graduates from a reformed elementary school (Study 7,  $N = 611$ , Study 8,  $N = 690$ ).

## 2.2. Measure

The Attitudes Toward Educational Reform Scale (ATERS) was the main measure used across all eight studies. ATERS was developed to explore differences in the evaluation of the reform as perceived by different groups of actors (parents, students more and less directly affected by the reform) or observers (general population). Initial version of the ATERS consisted of 5 items measured on a 5-point Likert scale (1 = definitely disagree, 5 = definitely agree). The items covered both the general evaluation of the reform and the more specific opinions that were present in the public discourse on the reform (see attachment for the full list of items). Sample item: “The reform will improve the quality of education.” The core five items of the ATERS remained the same across studies, yet additional items were added. More specifically, across studies, we used either the 5-item, 8-item, or the 13-item ATERS (see Table 1). To guard against acquiescence and response set behaviors [38], some items of ATERS were worded positively and some negatively. All negatively worded items were recoded, so a higher score denoted a more positive attitude toward the reform. While sometimes perceived to be controversial (see, e.g., [39]), we decided to use both positively and negatively worded items to prevent the threat of inattentive responding (see [40]).

**Table 1.** Samples’ characteristics and basic descriptive statistics of ATERS used across studies.

Sample	Time	N	Items	$\alpha$	5-item ATERS		Full ATERS	
					M	SD	M	SD
Representative 1	December 2018	1003	5	0.82	3.06	0.90	3.06	0.90
Representative 2	April 2019	1000	8	0.85	3.06	0.82	3.00	0.79
Representative 3	August 2019	1008	8	0.88	3.00	0.84	2.95	0.81
Parents 1	September 2018	1492	5	0.82	2.84	0.96	2.84	0.96
Parents 2	December 2018	236	5	0.87	2.55	1.02	2.55	1.02
Students 1	December 2019	5052	13	0.85	2.44	0.79	2.42	0.74
Students 2	June 2020	1168	13	0.83	2.39	0.75	2.39	0.69
Students 3	June 2020	1335	13	0.84	2.49	0.77	2.51	0.72

Note. ATERS = The Attitudes Toward Educational Reform Scale.

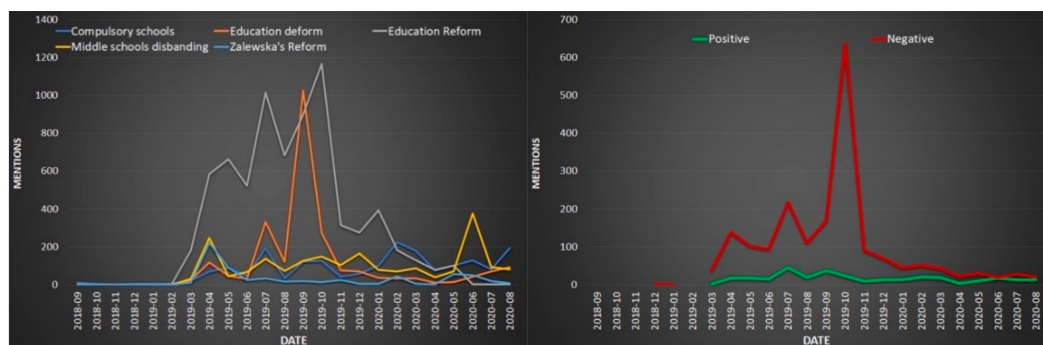
## 3. Results

We start with a basic overview of sentiment analysis as provided by internet monitoring. Our focus then moves to a series of empirical studies conducted to examine the ATERS’ psychometric properties as well as attitudes toward the reform in three groups of participants: the general population, parents, and students.

### 3.1. Social Media Analysis

Figure 1 presents the dynamics of social media discussions on the educational reform. As may be observed on the left panel, in the two years that we analyzed, the highest intensity was observed around the start of the school year 2019/2020—a moment when high schools had to accept twice as many students as usual: graduates from former middle schools and reformed elementary schools. As the right panel illustrates, sentiment analysis clearly shows that most social media relations were negative in terms of their sentiment. Still, however, given that there could be the silent majority, we decided to further explore

this effect by examining attitudes within the general population, namely the observers of the reform and two groups of its actors: parents and students.



**Figure 1.** The dynamics of the internet mentions of educational reform in Poland. (left) The raw number of mentions across different keywords used in the analyses; (right) positive and negative sentiment as aggregated across keywords (note that “educational deform” was excluded from sentiment analysis).

### 3.2. Actors’ and Observers’ Attitudes

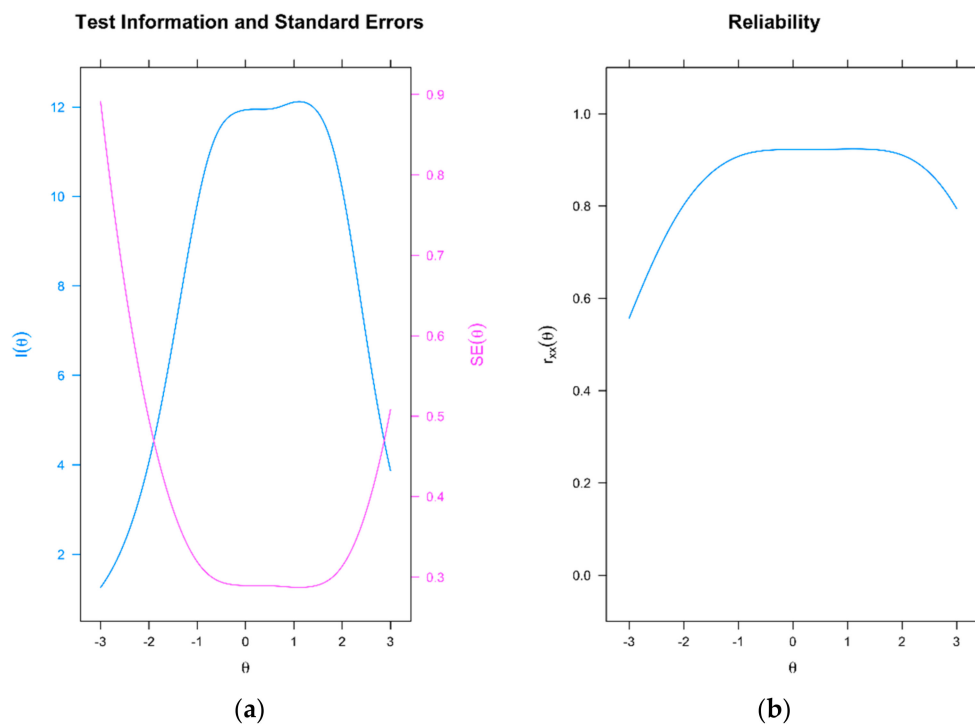
The characteristics of the samples and the time of the study are presented in Table 1. As illustrated here, our measure, the Attitudes Toward Educational Reform Scale (ATERS), evolved across studies. More specifically, while the first version of the ATERS consisted of only five items (this version was used in three studies: two on parents and one on the general population—all studies conducted in 2018), we decided to add three more items, and therefore we used an 8-item ATERS scale in two studies (both on the general population conducted in April and August 2019). It was finally extended into a 13-item ATERS used in three studies on students (completed December 2019 and June 2020). Across all studies, the five core items were the same; therefore, in Table 1, for comparability purposes, we present means and standard deviation for the fully comparable 5-item ATERS, as well as descriptive statistics for the full scale used in any study—be it 5, 8, or 13-item. Reliability (Cronbach’s  $\alpha$ ) was calculated for the entire scale in each study. Even the very first look at the means presented indicates that in the case of the general population, they were around 3 on a 5-point scale while being lower in the case of parents (2.84 and 2.55) and substantially lower than 3 in the case of students (range 2.39–2.49). However, we present the raw scores for illustrative purposes only and recommend relying on the more robust statistical analyses that we offer in order to conclude whether there are between-group differences. All items are presented in Appendix A.

Given the different lengths of the scale across studies, to have full comparability, we could either limit the scale to overlapping items or estimate our participants’ attitudes toward the reform using latent variables analyses. We decided to choose the latter and estimated models based on item response theory (IRT) and confirmatory factor analysis. For the IRT, we used graded response models as estimated in the *mirt* package for R [41]. Table 2 contains item discrimination, difficulty, as well as infit and outfit statistics. As observed, all items hold appropriate discrimination and sufficient difficulty. Infit and outfit parameters were within the recommended margins of 0.8–1.2, with most of the values close to 1, indicating a lack of misfit [42]. Confirmatory factor analysis with one latent factor loaded by eight items with the best parameters in the IRT analysis and using the full information maximum likelihood estimator in *lavaan* [43] yielded a good model fit [44], with comparative fit index (CFI) = 0.95, Tucker Lewis index (TLI) = 0.93, root mean square error of approximation (RMSEA) = 0.074, 90% confidence intervals: 0.071, 0.077, and standardized root mean square residual (SRMR) = 0.039. Given that IRT and CFA scores were very strongly related,  $r = 0.94$ ;  $p < 0.001$  (see also Appendix B), they could be treated interchangeably. We decided to use the IRT scores in further analyses, as they were obtained with information covered by all items across samples.

**Table 2.** Item Response Theory parameters for ATERS items.

Item	a	b1	b2	b3	b4	Infit	Outfit
Item1	1.91	−1.06	−0.14	0.95	1.93	1.01	1.07
Item2	2.34	−0.39	0.36	0.98	1.61	0.99	1.21
Item3	1.57	−1.46	−0.46	0.93	2.16	1.07	1.06
Item4	1.63	−1.25	−0.19	1.14	2.05	1.01	1.02
Item5	1.44	−1.33	−0.26	1.08	2.25	1.12	1.13
Item6	1.71	−1.00	−0.12	0.90	1.89	1.05	1.08
Item7	2.09	−0.62	0.29	1.11	1.88	1.03	1.05
Item8	2.25	−0.75	0.11	1.04	1.74	0.97	0.99
Item9	0.93	−1.42	−0.11	1.01	2.32	1.03	1.06
Item10	0.93	−1.82	−0.46	0.88	2.30	1.00	1.01
Item11	2.18	−0.63	0.21	1.05	1.71	0.94	0.98
Item12	2.00	−0.78	0.13	0.99	1.72	0.94	0.94
Item13	0.92	−1.72	−0.47	1.82	3.11	0.97	1.00

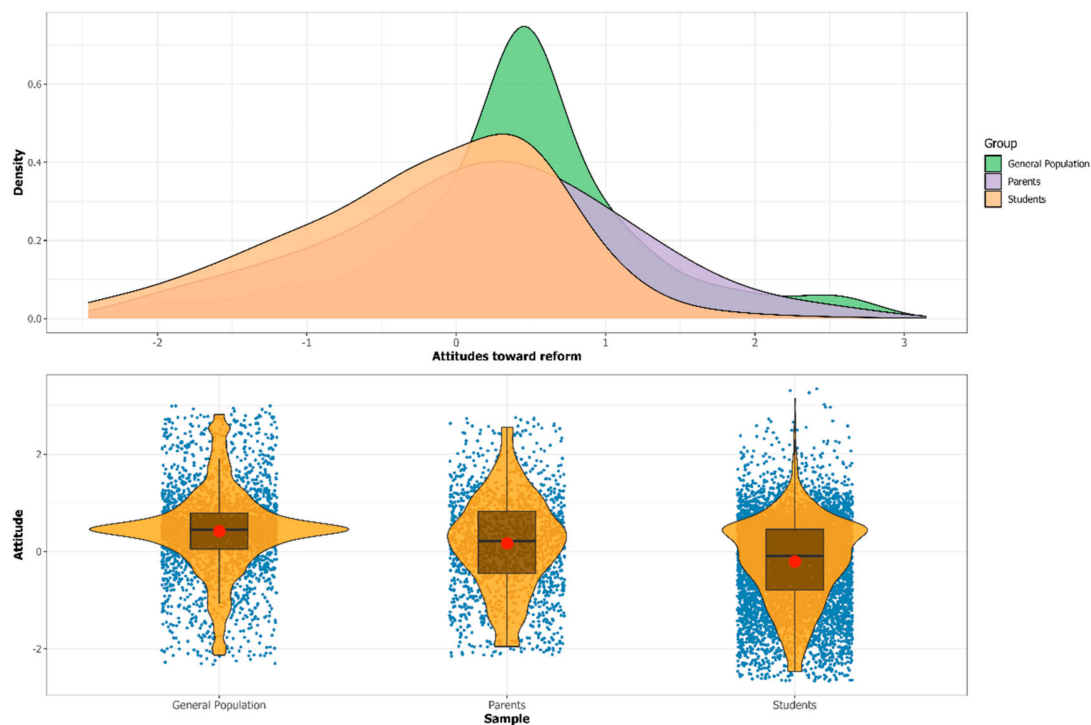
Figure 2 presents test information and standard errors (left panel) and reliability of ATERS scores at different levels of  $\theta$ —a latent trait describing attitudes toward the reform. Reliability was reasonable across the range of  $\pm 2$  standard deviation from  $\theta = 0$ , allowing for a precise measurement even among people with very negative or very positive attitudes.



**Figure 2.** ATERS information, standard error, and reliability as obtained in the two-parameter (2PL) IRT model. (a) Test information and standard errors of ATERS; (b) IRT-obtained reliability of the entire scale as conditional of the level of  $\theta$ .

How do different types of actors differ in terms of their evaluation of the reform? We proceeded with the analysis of variance (ANOVA) to explore this question, with a group as a factor and IRT-estimated score as the dependent variable. The overall effect was highly significant,  $F(2, 12291) = 551.80, p < 0.001$ , yet this is not particularly surprising given the large sample size. The effect size of between-group differences, quantified by  $\omega^2$ , was 0.08, thus signaling a moderate effect in strength. Post-hoc tests with Bonferroni adjustment found significant, yet relatively weak, differences between the general population and parents ( $M_{diff} = 0.25, SE = 0.03, p < 0.001, \text{Cohen's } d = 0.28$ ), and parents and students ( $M_{diff} = 0.37, SE = 0.02, p < 0.001, \text{Cohen's } d = 0.41$ ), and large differences between the

general population and students ( $M_{diff} = 0.62$ ,  $SE = 0.02$ ,  $p < 0.001$ , Cohen's  $d = 0.71$ ) (see Figure 3).

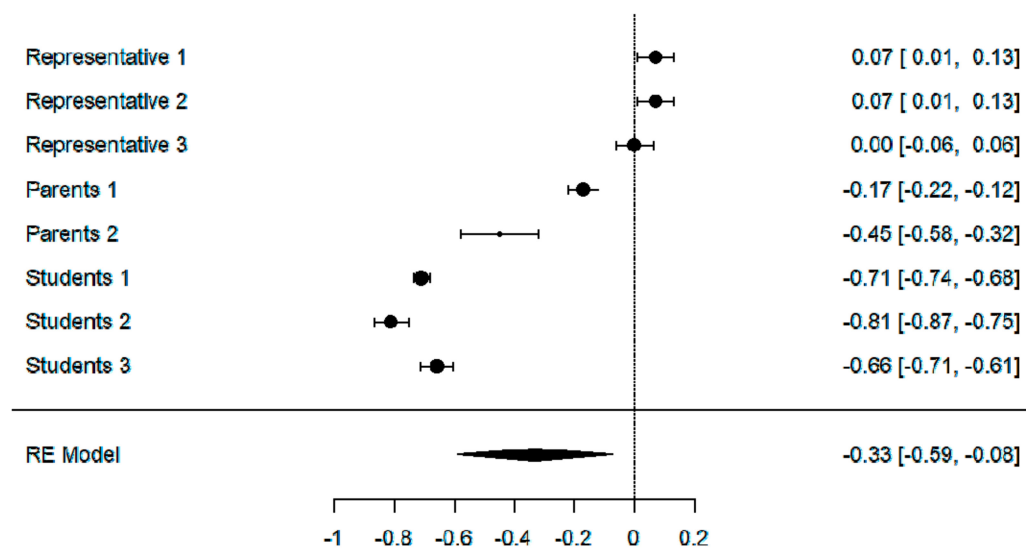


**Figure 3.** Attitudes toward the reform across the groups. The upper panel illustrates the differences in distribution and the lower panel the differences in means and medians. Red dots are means.

Although our ANOVA shows that students were more skeptical toward the reform than parents, and both parents and students were more skeptical than the general population, it does not tell us whether—in general—the attitude was positive or negative—a crucial piece of information for understanding the overall attitude held. However, this information is possible to be obtained, taking into consideration the natural average on a raw scale (i.e., the value of 3 that corresponds to  $\theta = 0$  in IRT models). Therefore, for each study, we subtracted the average obtained from 3 to have a positive (if the value is above 0) or negative (if it was negative) attitude. We translated these raw distances into Cohen's  $d$ s by dividing them by the difference's standard deviation. Then, we conducted a random-effects meta-analysis [45] to quantify overall attitude and its moderators. Having such a transformation, values larger than 0 indicate a generally positive attitude, 0 denotes a neutral attitude, while all negative values represent a negative attitude toward reform.

Figure 4 shows the effect size in all eight studies analyzed in this paper. While the overall meta-analytically obtained effect was statistically significant and negative,  $d = -0.33$ , 95% CI:  $-0.59, -0.08$ ,  $p < 0.001$ , thus showing a negative attitude toward the reform, it was also highly heterogeneous,  $Q(df = 7) = 1410.39$ ,  $p < 0.001$ ,  $I^2 = 99.46\%$ . A group of participants moderated the effects. As illustrated in Figure 4, there were much more pronounced differences in terms of the obtained effects between groups than between studies within groups. Indeed, the group served as a statistically significant moderator,  $Q(df = 2) = 33.72$ ,  $p < 0.001$ . More specifically, there was a strong negative attitude toward the reform observed among students ( $d = -0.77$ ), a weak-to-moderate negative attitude among parents ( $d = -0.33$ ), and a neutral assessment of the reform among the general population ( $d = 0.05$ ) (Table 3).





**Figure 4.** Forest plot showing the effect size of positive-versus-negative attitudes toward the reform across samples and studies.

**Table 3.** Attitudes toward the reform as aggregated across samples—group as a moderator.

Group (Moderator)	<i>d</i>	<i>SE</i>	<i>z</i>	<i>p</i>
General Population	0.047	0.055	0.85	0.393
Parents	−0.332	0.090	−3.71	<0.001
Students	−0.773	0.076	−10.12	<0.001

#### 4. Discussion

Radical changes in school systems and curricula are often associated with more passive or active resistance. Yet, when changes are well thought out and communicated properly, public opinion usually accepts them [11]. This study investigated the attitudes of the general public, namely observers and actors, influenced by the changes (parents and students) introduced by the 2017 Polish reform. As discussed in the Introduction, this reform was problematic on several grounds. First, it created significant changes in a system that was considered highly successful, at least when students' competencies were taken into account [19,27]. Second, the rationale for the changes did not relate at all to evidence and experts' opinions; instead, it was politicized. Third, and finally, the changes were associated with a lack of consultation and quite a radical transformation of both the school structure and curricula—a factor that caused teachers' and parents' protests.

We argued that better insight into what people think about the changes is interesting from a theoretical point of view and may also have important practical and policy consequences. Indeed, as demonstrated in other countries [11], reformers who do not have broad public opinion support are often unsuccessful and, with time, have to quit reforms. Therefore, attitudes could be considered as factors that drive the sustainability of introduced changes, their stability, and their chances for success. Moreover, democratization of education gives different voices (those of teachers, parents, and students) equal importance and weight as well as the right to be heard and considered [13,16].

Our set of studies demonstrated that the attitude toward these changes is highly dependent on who evaluates them. It seems justified to conclude that the attitude is neutral among the overall public. The results obtained in representative samples were normally distributed, with an average being almost precisely 3 on a 1–5 scale. This somewhat mild attitude might be interpreted in at least two different ways. The first is that people who are not directly influenced by the changes, namely those who are not teachers or parents of schoolchildren, do not care much about the changes introduced. As most of them attended pre-1999 reform schools themselves, it might indeed be the case that these people perceived

the changes as a return to the past schools that they were familiar with. If such reasoning is correct, it is not particularly surprising that the attitudes are generally toned. The second explanation might focus on the fact that attitudes toward the reform are strongly related to political preferences [17]. The ruling party supporters tend to perceive the changes positively, while the voters for the opposition reject the reform [17]. If this is the case, the average attitude would be moderate, yet caused by a high polarization of opinions rather than a lack of strong opinions. However, our results contradict this reasoning. High polarization would imply a bimodal distribution of the reform's attitudes, with a peaked number of both supporters and rejectors. As illustrated in Figure 3, this was not the case, and, overall, the distribution of the attitudes followed a Gaussian curve. It is thus interesting to compare this result to the sentiment analysis that we presented. It was clearly negative, which leads to the conclusion that people who were more positive and neutral rarely commented on the reform in their social media or internet forums.

Consistently with our predictions, the attitudes were moderated to a large degree by the group of participants whom we asked about the reform. More specifically, while the general population's attitudes could be described as neutral, what was observed among parents should be labeled mildly negative. In contrast, the attitudes among students were clearly negative. Among parents, the average effect size obtained in our meta-analytical summary was  $d = -0.33$ , denoting a weak effect size [46]. Still, however, the tendency observed among parents was negative: while, in September 2018, the effect was  $d = -0.17$ , three months later, when the problems caused by the reform became apparent (the school year in Poland starts in September), it dropped to  $d = -0.45$ —a statistically significant and negative effect of moderate strength.

Finally, our three large samples of students were characterized by consistently negative attitudes that were large in terms of the effect size ( $ds$  between  $-0.66$  and  $-0.81$  with an average of  $d = -0.77$ ). Therefore, indeed, students who were most strongly influenced by the changes that introduced uncertainty regarding the near future but also pushed them to change their plans, and whose teachers were strongly dissatisfied with the chaos around them and were afraid that they would lose their jobs, reported evident skepticism toward the reform. Even a brief look at the distribution presented in Figure 3 shows that there were very few students (apart from our extensive samples) who could be considered supporters of the changes.

One question that stems from our results is to what extent the attitudes we measured might be caused by neophobia and resistance to change in some people [47], the effect of certain political views and personality traits [47], or ignorance or indifference caused by the fact that the changes are not directly influencing the participant. While all these factors are plausible, future research is needed to resolve the antecedents of the attitudes toward reform more fully. Future investigations would also benefit from further application and the refinements of the ATERS—the brief scale that we developed. We emphasize that while some of its items were context-specific and therefore may be of lesser fit for international studies, others are general enough to be useful in cross-cultural studies of educational reform evaluation among different groups of actors.

There are several strengths but also limitations of the current investigation. Among the strengths, we list triangulation of automatized sentiment analyses with survey research. Additionally, given the size and representativeness of our samples, we conclude that the estimates obtained could be generalized to the three groups that we analyzed: parents, students, and the general public. Third, and finally, we emphasize the psychometric parameters of our ATERS instrument as illustrated but both the IRT and the CFA. Still, however, some limitations should be taken into consideration while interpreting our findings. The main among them relates to the descriptive and exploratory nature of our study. Although, indeed, our goal was to describe and evaluate overall attitudes toward the reform, future studies should focus on potential explanations and antecedents of the factors standing behind the differentiation of results within groups. Candidate variables include political preferences, socioeconomic status, and certain psychological characteristics, such

as uncertainty acceptance or risk aversion. We also acknowledge that the automated sentiment analysis that we used does not allow for a detailed description of the emotions present in online discussions and comments. Instead, it is able to provide a very basic categorization of different sources into positive, negative, and neutral.

## 5. Conclusions

This study demonstrates that the attitudes toward the recent educational reform in Poland—while negative overall—depend significantly on the group asked to evaluate it. The attitude within the general population was found to be neutral, yet it was negative among the most directly affected group of actors: students.

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**Data Availability Statement:** Data are available upon request.

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## Appendix A

**Table A1.** ATERS Items.

1.	The reform will improve the quality of education
2.	The liquidation of lower secondary schools and the extension of primary school education introduces unnecessary chaos in the curricula
3.	The reform will make it possible to adapt education in schools to the needs of the labor market
4.	The reform is too much of a financial burden for local governments and should not be introduced
5.	The new education system will affect the leveling of educational opportunities for children in rural and urban areas
6.	The school had to be changed, and it's good that it finally happens
7.	The change as a result of the reform puts children overwhelmingly overburdened and harms them greatly
8.	Reform must be thoughtful - this reform destroys what is good and introduces nothing better
9.	The problems with the number of places in secondary schools are exaggerated

Table A1. Cont.

10.	If the student is good, he will get into his dream school - failure is not the fault of the government
11.	From September, a huge mess awaits us in secondary schools for which the government is to blame
12.	The education reform will spoil the lives of a few years old children
13.	Local governments, not the government, are to blame for the lack of a place in secondary school

## Appendix B

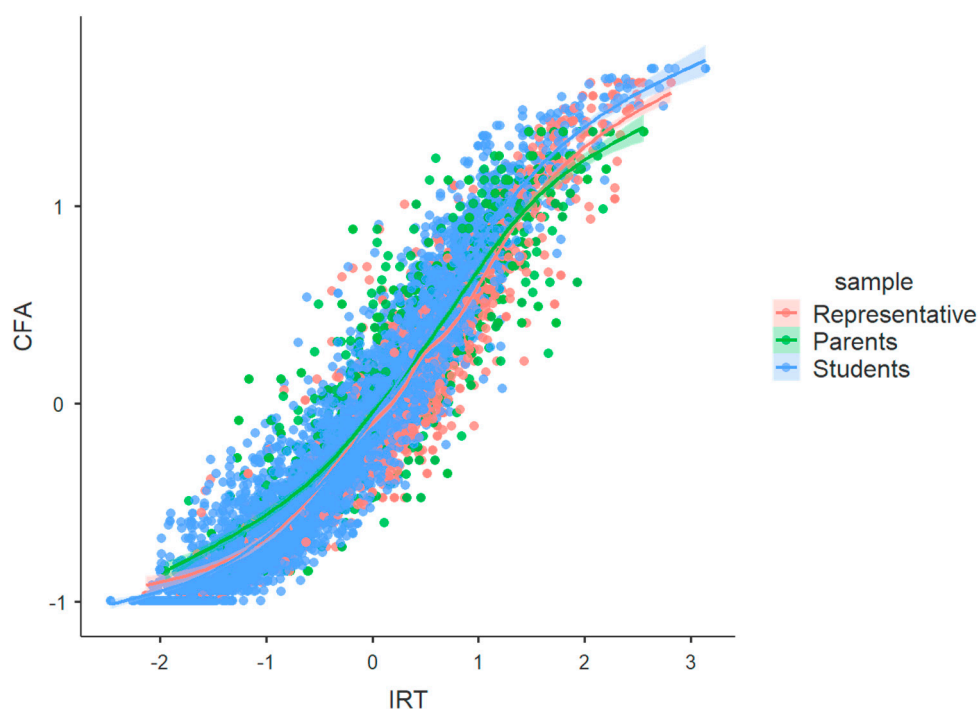


Figure A1. Correlation between CFA- and IRT-obtained scores.

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