

COST-EFFECTIVENESS OF VOCATIONAL EDUCATION OF LOGISTICIANS IN POLAND IN THE CONTEXT OF THE EXAMINATIONS PROCESS

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Andrzej Bujak

WSB University in Wrocław

Paweł Andrzejczyk

Państwowa Wyższa Szkoła Zawodowa im. Witelona w Legnicy

Ewa Rajczakowska

Zespół Szkół Technicznych i Ogólnokształcących im. Henryka Pobożnego w Legnicy

Abstract: The aim of the article is to present the system of vocational education for the TSL sector at the secondary school level with regard to financing vocational education in the aspect of achieved effects by students /learners in the form of pass rate of the exam confirming professional qualifications. The paper was based on the analysis of formal and legal documents and normative acts applicable in the described area. The article presents basic legal acts and formal rules determining the organization of financing the education system. This study is an element of research related to the development of a PhD dissertation, thus constituting the basis for further research and reflection in the discussed area.

Keywords: vocational training in Poland, financing of vocational education in Poland, expenses for one student, TSL sector, exam confirming qualifications in the profession.

Słowa kluczowe: kształcenie zawodowe w Polsce, finansowanie kształcenia zawodowego w Polsce, wydatki na jednego ucznia, sektor TSL, egzamin potwierdzający kwalifikacje w zawodzie.

Introduction

The calculation of cost-effectiveness in the sphere of education is neither an easy nor a simple factor. In addition to purely economic indicators, elements such as raising public knowledge or building a knowledge-based economy are at stake. Neverthe-

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less, in each activity, the smallest possible cost should be pursued for a given task, and so in professional education, this indicator should be permanently examined and analyzed, and its results should be used to optimize the funds spent.

The costs of education in Poland constitute a very important area of reflection, both in the bodies running educational institutions as well as in the schools themselves. However, the scope of discussions in this area usually comes down to the analysis of costs in terms of expenses incurred on an annual basis with an emphasis on looking for savings, practically on everything possible. Such perception of reality does not, by nature, satisfy the basic function of diagnosing the system, because it does not illustrate the nature of the problem. This is due to the fact that the process of teaching one student depending on the type of school lasts from 3 to 6 years. Another problem of considerations related to the cost of education results from the duration of the school year and the budget year, which usually start and end at different dates. In addition, it should be noted that the value of money in the education cycle of one student may change its value several times. Therefore, the question arises how to approach the calculation of the total costs of educating the student, how to compare the costs of education in the facility in which future mechanics are trained, with the one that trains, for example, shippers? What factors should be taken into account to calculate the average costs of education, e.g. a student from a particular year? How to take into account the fact that learning is carried out in the school year cycle, and the financing of the school takes place in the course of the budget year?

Based on the above, the following question arises: What is the efficiency of expenditures on education of students in relation to expenditures incurred by the Polish state and the results achieved by students on external examinations?

In connection with the above, the purpose of the presented article is to put forward an analysis of the effectiveness of financing educational units from the state budget, budgets of local government units and external sources in relation to the results of external examinations confirming qualifications in the profession. The report is based on the analysis of legal norms, statistical data available in CKE (General Examination Commission) and source literature.

The basic principles of financing education in Poland

Financing education is one of the basic tasks of each self-government. The municipalities themselves are responsible for education from kindergarten to middle school. The districts deal with upper secondary and special education. It should be remembered that the maintenance of schools does not belong to the self-government's own tasks. Therefore, Municipality/District Authority Office for the budget allocated for education receive a specific educational subsidy.

In connection with the above, expenditures for a pupil of a primary school and middle or technical school are varied between municipalities/districts. It results firstly from the diversity of the school network (the size of schools and branches). The larger the school and the branch, the less funds are allocated per pupil. At the same time, the fact that rural communes spend more on the student is related to the existence of special rural additions, for example in perks for teachers working in rural areas and in towns of up to 5,000 residents.

From the IBE survey in 2014, the average cost per country for one student in primary school was 8,160 PLN, 8093 PLN in middle school, 6364 PLN in high school, and 7,365 PLN for a vocational school. The report indicates that in Poland the most expensive is the maintenance of students in special schools, in which the year of study of one student at the basic level costs 37723 PLN, in middle school 23275 PLN, and in the vocational school the cost was 34050 PLN per year (Nowakowska, 2014).

The amounts of subsidies for education received by municipalities/districts are updated every year. Currently, the educational part of the general subsidy is used to finance educational tasks performed by local governments. The size of the educational subsidy for all stakeholders is determined each year by the budget act. The minimum amount of funds is guaranteed by the provisions. The amount of the educational subsidy is determined in the amount of the total amount not less than that adopted in the budget act in the base year adjusted by the amount of expenses for the change of performed educational tasks. 0.4% of the funds earmarked for the special-purpose reserve are also deducted from this amount. The amount of the educational part of the general subsidy is divided between individual JSTs (Local Self-government Unit) by means of an algorithm determined annually by the Minister by regulation (Adamowicz & Kmiecinski, 2017).

An important change in the financing of the education system was announced by the draft regulation of the Minister of National Education on the method of dividing the educational part of the general subsidy. This document assumed that schools that will work for one shift and will run less numerous classes will receive more money from the state budget for functioning. The Ministry of National Education announced a revolution in the way education is financed. Thus, announcing that from January 1, 2018, local governments will no longer receive a fixed amount of subsidies and subsidies per student. The proposal of new regulations also clarified the criteria for the division of the educational part of the general subsidy in the financing of preventive health care and pre-nursery services in connection with the entry into force of the law on specific solutions ensuring the improvement of the quality and accessibility of healthcare services. What is important, the regulation also introduces “subsidies for effect” – changes in weights for general high schools for adults, post-secondary schools, and qualifying vocational courses. The previous subsidy for students of particular types of schools has been divided into two

parts: “for taking part in classes” and “for passing the exam”. The changes proposed by the Ministry of National Education promoted schools that will reach high pass rates, and thus a higher subsidy will be calculated for students of these schools in the same amount as before or even higher, while in the case of students with low pass rate, a lower subsidy than before will be applied to them. The draft regulation eventually came into force on January 1, 2018. Based on what the draft budget act for 2018 is planned for, the educational part of the general subsidy in the amount of 43 million 079 thousand PLN is planned, which was higher in relation to the amount of the educational general subsidy included in the Budget Act for 2017 by 1 million 169 thousand PLN (MEN, 2019).

Currently, in accordance with the Regulation of the Minister of National Education on the manner of dividing the educational part of the general subsidy for local government units in 2019, the amount of subsidies will depend on the number of conversion pupils received by applying different weights and indicators for selected student categories, specific types of students and types of schools as well as the correction factor, which takes into account the professional advancement of teachers. According to the recommendations of the Ministry of Education, the application of this indicator will allow transferring higher amounts of the general educational subvention to those local governments where the share of teachers with the highest levels of professional promotion in relation to the total number of posts is higher than the national average, which translates into a level expenditure for teachers' salaries incurred by individual local government units. It is worth noting that according to the regulation, the algorithm of division of the educational part of the general subsidy includes an increased educational subsidy for schoolchildren studying in professions for which higher demand on the labor market is forecasted. In 2019, when the subsidy was divided, funds were allocated for the implementation of activities in the field of psychological and pedagogical assistance, which until now was omitted while financing educational institutions. The Regulation introduces two weights, which are differentiated by the type of schools, 0.025 respectively for primary and middle school students and 0.012 for secondary school students, in addition, the regulation in the 2019 algorithm includes, inter alia (Rozporządzenie Ministra Edukacji Narodowej z dnia 18 grudnia 2018 r.):

- increase of the subsidy calculated for local government units running / subsidizing secondary schools in connection with the recruitment of two years of children from September 1, 2019 to these schools,
- realignment of the financing of vocational education due to the cost of education in individual professions,
- increase in funding for students attending competitions as a mechanic driver or road transport technician in connection with the introduction of a psychological examination for candidates for training in these professions,

- adjusting the method of calculating subsidies for minority students to the next stage of implementing the education reform.

Despite the fact that the Polish education system is financed mainly from the state budget and the maintenance of schools is one of the main expenditures of local government, the research shows that in the case of municipalities, education expenditure ranged on average from 35 to 45% of their budget. It should be remembered that education is also financed from extra-budgetary sources, including European Union and private funds. Although the main source of financing education is the state budget, from which subsidies and subsidies have been transferred to the budgets of territorial self-governments and public expenditure on education for 15 years are systematically growing both in the general dimension and per one student, the role of extra-budgetary funds obtained for education especially the professional one is extremely important. It can be clearly stated that a school which has its patrons in education is much better able to prepare its students for future market realities. This topic will be subject of a broader analysis later on.

Vocational education in Poland at the secondary school level in the area of TSL sector

The concept of vocational education is most often defined in pedagogical literature as a process whose aim is to provide pupils/students with a specific resource of knowledge and skills in the field of industry, agriculture and breeding as well as services understood broadly. This process includes the transfer of general knowledge and specialist theoretical and practical skills, the mastery of which entitles students to perform a chosen profession. The result of vocational education is vocational education obtained in a specific specialty (Kupisiewicz i Kupisiewicz, 2009, p. 90).

Modern learning processes are compared with the concept of quality. Analyzing the organizational documentation of educational entities, it can be clearly seen that the word “quality” repeats itself constantly. This applies to both the area of education itself and the acquired pupils / students who are assessed in terms of both quantity and quality. One of the basic parameters evaluating the quality of services provided by educational entities is the level of passing external examinations by students of a given educational institution.

It should be noted that in today’s society awareness is constantly increasing, and thus the requirements related to the level of quality of educational services are also growing. In the last ten years, the free market has become a place where the consumer, not the producer, dictates the terms of purchasing goods and services, including educational services. At this point, pay attention to the term “customer”, meaning the one that sets the requirements. In high school education, a student/learner is the direct client who, simultaneously with the parent, wants the select-

ed institution to provide high-quality educational services, the teachers/lecturers working in it are involved in educational processes and this in turn is to be high level of passing examinations.

In connection with the above, in today's school it is extremely important that communication between particular entities involved in the educational process is effective and aimed at achieving the highest possible level of Polish education. This is assured to every citizen by the Constitution of the Republic of Poland, which includes educational guarantees in the chapter on economic, social and cultural freedoms and rights. The provisions of the Polish Constitution show that citizens have the right to education, and up to the age of 18, education is compulsory. Public education is free. Other educational rights include: freedom to choose a school for a child, universal access to education, freedom to establish non-public schools, the right to financial aid from the state, as well as the autonomy of higher education institutions. Schooling in the Republic of Poland is the common good of the whole society. Education and upbringing contribute to the development of a sense of responsibility in children, love for their homeland and respect for the Polish cultural heritage, while opening up to the values of the cultures of Europe and the world. The school should provide each student with the conditions necessary for its development, prepare it for fulfilling family and civic duties based on the principles of solidarity, democracy, tolerance, justice and freedom. (Konstytucja Rzeczypospolitej Polskiej z dnia 2 kwietnia 1997 r.).

In recent years, it can be noticed in the Polish education that the autonomy of individual schools has increased significantly, the role of the Head Teacher in the efficient management of the educational institution has increased and the range of independence of teachers has increased. It should be noted that the changes introduced to the core curricula have given educators the possibility of more flexible and creative implementation of school curricula, enriching them with content resulting from the needs of the local environment as well as industrial circles. Hence the extraordinary popularity of the TSL branches offered by schools.

In the 2016/2017 school year, in the three most popular logistics professions among young people: forwarding technician, logistics technician and port and terminal operation technicians, about 49 thousand students were learning. In the same school year, approx. 5,000 students who have completed all the required qualifications and obtained the professional title of a technician graduated (Fechner & Szyszka, 2018, p. 150).

In 2016–2017, systemic changes took place in vocational education. As a result of the reform of the education system, the technician gained the fifth year of education, thus returning to the condition from before the 1999/2000 school year. In addition, from the 2017/2018 school year, recruitment to the first level of industry schools began, for which the logistics profession appeared in the list of occupations (AU.22 qualification, profession symbol 432106).

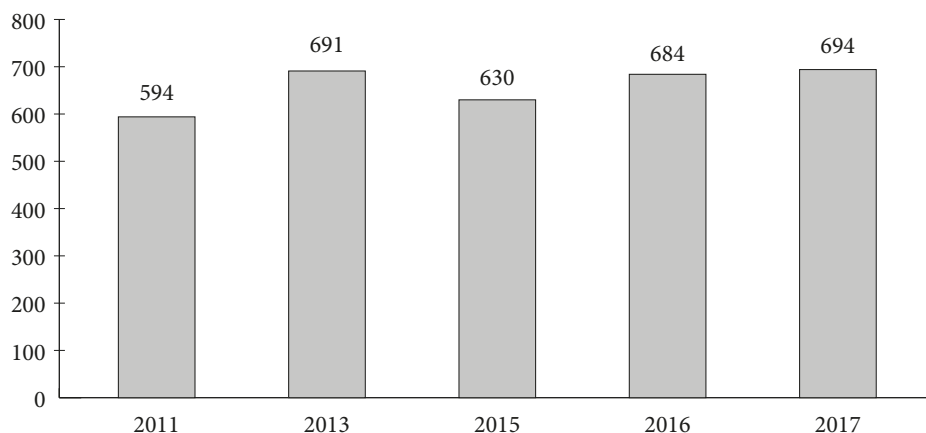


Figure 1. Number of schools in which in the years 2011–2017 technicians were trained in logistics professions

Source: data from the Ministry of National Education in 2012–2018.

Since the previous survey, the number of schools educating in logistic professions has increased, returning to the state of 2013 (Fig. 1) and their structure has changed significantly. In 2016–2017, there was a sharp drop in the number of post-secondary schools educating in logistics professions. The extinguishing of logistic training in this type of schools is visible (Fechner & Szyszka, 2018, p. 150).

Logistics technician dominates in logistics education in techniques for youth. The next two professions young people are interested in are the freight forwarder and port and terminal operation technician (Tab. 1). It is worth emphasizing that in the group of logistics competition a new field of study has also emerged - logistic warehouseman. At the moment there is no reliable data, how many schools introduced education in this profession.

The popularity of logistics among young people is also evidenced by the fact that the 2016/17 and 2017/18 school years brought another increase in the number of

Table 1. Number of schools in which logistics specialists are trained

Name of the profession	2015	2016	2017
Freight forwarder technician	118	129	138
Logistics technician	364	395	409
Port and terminal operation technician	115	123	106
Road transport technician	16	9	8
Railway transport technician	17	28	33
Total	630	684	694

Source: data from the Ministry of National Education 2016–2018.

participants of the National Logistics Competition organized by the College of Logistics based in Poznań (Fig. 2). As it results from the data analysis, the number of schools participating in the Contest decreased slightly (Fig. 3). In the school year 2017/2018, the tenth edition of the Contest took place.

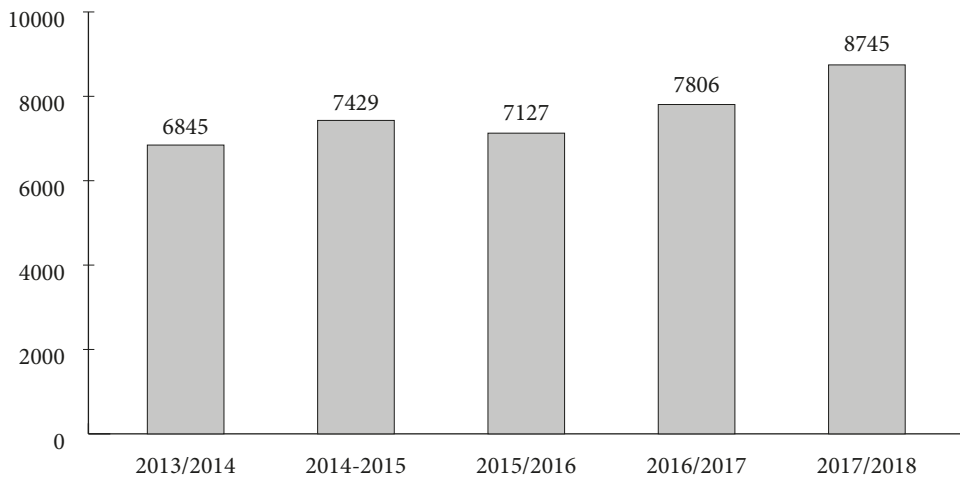


Figure 2. Number of participants of the National Logistics Competition

Source: data from the Poznan School of Logistics.

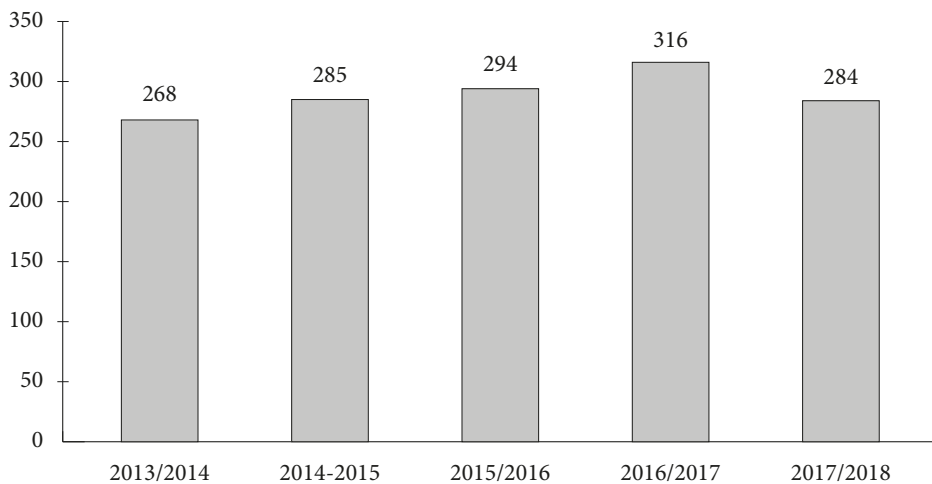


Figure 3. Number of upper secondary schools participating in the National Logistics Competition

Source: data from the Poznan School of Logistics.

One of the effects of the reform of education binding from 1 September 2017 is the return to five-year youth technicians, which increases the number of teaching hours and will enable better implementation of teaching programs. The emergence of the warehouse-logistics profession in 1st level industry schools extends the logistic education chain by another link. From these schools, graduates will be recruited to work in positions related to warehousing, and some of them will join the second-level sector schools enabling them to obtain qualifications at the level of a technician. In post-secondary schools, the process of terminating logistic training will continue (Fechner & Szyszka, 2018, p. 151). In youth technicians one should expect further dominance of the profession of logistics technician. Due to the structure of the logistics market, the profession of forwarding technician requires significantly greater promotion among young people. An increase in the interest in occupational rail transport techniques should be expected, as some schools intend to train drivers in this framework, the lack of which is increasingly noticeable. The first school in Poland educating in the profession of a railway transport technician and having its own training and examination center for train drivers is Zespół Szkół Technicznych i Ogólnokształcących im. Henryka Pobożnego [the Technical and General Schools of Henry the Pious] in Legnica.

The reform of vocational education also changed the approach to matters related to the organization and conduct of vocational examinations. The division of competitions into qualifications resulted in the exam being taken from a given qualification, and not from the entire profession. The separation of material implemented during education was to theoretically enable more accurate and better verification of persons taking the exam in terms of acquired skills.

Another important element of the exam is the division into the theoretical and practical parts. During the theoretical part, the hypothetical knowledge of a student from a given range is checked. It is important to emphasize that, the practical part of the exam has changed the most and has been modified in relation to the current form. So far, in the competitions carried out at the technical school, the practical exam consisted of completing the task “on paper”, that is, descriptively. Such a solution did not allow for a real check of the student’s professional competence. At present, for a part of the competition, the practical part of the vocational examination is actually “practical”, i.e. the exam being carried out consists in completing a task taken from a typical, real situation that may occur while performing professional tasks. The examiner, who conducts the exam, also acts as an observer, and his main task is to verify and evaluate not only the result of the task, but mostly, all intermediate elements that make up the way it is performed. Unfortunately, most of the exams are still resolved on paper, and examination tasks have a large number of errors.

The examination confirming professional qualifications consists of a written part of the exam, which lasts 60 minutes and can be carried out with the use of an electronic examination system. The research results show that most schools choose the

traditional form in the shape of paper sheets and answer cards. The second part of the so-called practical examination lasts 120, 150, 180, 210 or 240 minutes and is carried out according to one of the models below (CKE, 2018):

- w – when the end result is a product or service,
- wk – when the final result is a product or service obtained using a computer,
- d – when the only final result is documentation,
- dk – when the only final result is documentation obtained using a computer.

The written part with the use of the electronic examination system and practical part of the exam are carried out at school, institution, at the employer or at the certificated qualification course holder, authorized by the director of the examination committee competent for the seat of the school / institution, place indicated by the employer and place of conduct qualifying vocational course indicated by this subject. (Rozporządzenie Ministra Edukacji Narodowej z dnia 27 kwietnia 2015 r.).

The chairman of the examination team is responsible for preparing and conducting the vocational examination at the school, institution, employer and in the entity conducting the qualifying vocational course (CKE, 2018):

- at school or institution – headmaster of a school or institution,
- in the entity conducting the qualifying vocational course – the person managing this entity, or a person indicated by it,
- at the employer's – employer, or a person designated by him.

The exam confirming the qualifications in the profession is carried out: (Rozporządzenie Ministra Edukacji Narodowej z dnia 18 sierpnia 2017 r.)

- within the scope of a given vocation or occupation in accordance with the classification of vocational education occupations,
- based on the requirements set out in the core curriculum of vocational education.

The examination confirming the qualifications in the profession is carried out until October 31, 2025 as an extramural vocational exam for people who:

- graduated from a junior high school or an eight-year primary school,
- have been training or working for at least two years, in a profession in which a given qualification has been distinguished according to the classification of vocational education occupations.

For the exam confirming the qualifications in the profession carried out in accordance with the provisions of the Act on the education system in the wording effective before 1 September 2017 and based on the program basis of education in occupations from 2012 (CKE, 2018):

- students of the current basic vocational schools, technical schools and post-secondary schools who started their studies no earlier than September 1, 2012, but not later than August 31, 2017 and implemented the core curriculum from 2012,
- graduates of four-year-old technicians who started their studies not earlier than September 1, 2012, but not later than August 31, 2017 and implemented the core curriculum from 2012 – until the school year 2024/2025;

- graduates of post-secondary schools who started their studies not earlier than September 1, 2012, but not later than August 31, 2017 and implemented the core curriculum from 2012 – until the end of the school year 2024/2025;
- people who have completed a qualification course run based on the core curriculum of vocational education from 2012 – until October 31, 2025;

The student, in order to pass the exam confirming a specific qualification separated in a given profession, must obtain the appropriate number of points. From the written part - at least 50% of the points possible to obtain and the practical part – at least 75% of the points possible to obtain. The test taker who has obtained positive results in the scope of each professional qualification is awarded a professional diploma. The examinee who has confirmed a specific qualification distinguished in the profession receives a qualification certificate. (Rozporządzenie Ministra Edukacji Narodowej z dnia 26 kwietnia 2018 r.).

For the purpose of correct verification of learning outcomes, for each examination set, the task authors prepare very detailed information, what effect at a given moment and at which stage of the exam is verified. In addition, issues related to student's social competences (CSR) are very much marked and described in detail in the examiner's documentation and the exam. This allows to objectively check all learning outcomes without skipping any element. The positive result of the exam is to be proof not only that the examined person acquires the required knowledge and substantive competences, but also confirms that the candidate has an appropriate social and moral attitude that will enable him to carry out the tasks entrusted, including those consistent with CSR principles with finding employment. Employers still point to their shortage in the labor market.

The costs of vocational education and the results of the exam confirming the qualifications in the profession at the high school level in the occupations of the TSL industry

In Poland, from September 2013 to July 2018, an examination confirming vocational qualifications in all occupations was passed by over 1.5 million people (Tab. 2). The average pass rate of the written part for this period was at the level of 85%. The practical part at that time was successfully completed by 77% of the participants. However, only 73% of those passing the exam successfully completed both parts of the exam. Analyzing the passing of examinations, it can be stated that there is no constant tendency as to the level of passing of exams in individual sessions.

In connection with the above results, the question arises as to the effectiveness of education in relation to the incurred costs of education. For the purpose of this study, it was decided to assume that in the described period, the average cost of edu-

Table 2. Number of persons taking the exam confirming vocational qualifications in 2013–2018

No.	Month and year of the exam	Written part of the exam			Practical part of the exam			The written and practical part of the exam in total		
		took the exam	passed	pass rate (%)	took the exam	passed	pass rate (%)	took the exam	passed	pass rate (%)
1	August-September 2013	456	434	95.18	447	436	97.54	444	416	93.69
2	October-November 2013	2,266	1,822	80.41	2,262	1,559	68.92	2,105	1,258	59.76
3	January-February 2014	25,377	2,1876	86.20	27,044	15,703	58.06	24,149	12,984	53.77
4	June-July 2014	120,867	99,526	82.34	121,585	88,588	72.86	118,489	76,482	64.55
5	August-October 2015	19,838	15,267	76.96	20,373	15,406	75.62	14,957	1,0404	69.56
6	January-February 2016	187,321	159,611	85.21	184,151	137,438	74.63	164,026	116,140	70.81
7	May and June 2016	1,346	1,341	99.63	1,347	1,319	97.92	1,324	1,306	98.64
8	June-July 2016	248,951	213,891	85.92	246,682	206,799	83.83	239,074	181,118	75.76
9	August-October 2016	21,290	15,138	71.10	28,666	16,651	58.09	13,209	8,952	67.77
10	January-February 2017	176,224	153,443	87.07	179,105	133,011	74.26	157,470	114,281	72.57
11	May and June 2017	1,576	1,559	98.92	1,604	1,562	97.38	1,568	1,519	96.88
12	June-July 2017	253,859	224,434	88.41	250,509	209,539	83.65	241,301	188,274	78.02
13	January-February 2018	178,720	153,935	86.13	192,835	140,176	72.69	158,508	114,311	72.12
14	May and June 2018	1,604	1,603	99.94	1,621	1,609	99.26	1,587	1,579	99.50
15	May and June 2018	265,239	227,941	85.94	273,588	219,135	80.10	243,970	188,279	77.17
16	The years 2015–2018 in total	1,504,934	1,291,821	85.84	1,531,819	1,188,931	77.62	1,382,181	1,017,303	73.60

Source: own study based on CKE reports (CKE, 2014; 2015; 2016; 2017).

cation for one student per year was 5,000 PLN. It should be noted that this amount applies only to pupils who took the exam in a given year and concerns the year in which the pupil/student took the exam. The calculations have omitted the costs that were incurred on the training of the examinee in the year preceding the exam and the costs of the exam itself.

Table 3 shows that the education of students/learners in vocational schools is capital-intensive. The estimated cost of vocational education in 2013–2018 and only those who took examinations confirming qualifications in the profession was at the level of almost 7 billion PLN. These data are estimates and apply only to persons who first took the exam in a given qualification. It should be noted that over 25% of funds invested in education did not bring the desired effects in the form of receiving a qualified employee with a diploma confirming professional qualifications. This means that almost 2 billion PLN has been badly invested, and the labor market instead of receiving a qualified employee will not receive anything in return.

Table 3 presents the estimated expenditure on the education of all persons taking examinations in the period from September 2013 to July 2018. The costs of education for two qualifications from the TSL area for comparison are presented below in Tables 4 and 5. The first is the qualification marked A.29, whose name is “Customer and contractor service”. This qualification is one of the two forwarding technicians need for the profession. The second is the A.44 qualification, i.e.: “Organization and running of train” for the profession of rail transport technician.

Analyzing both qualifications, it should be noted that for the first discussed qualification, over 30% of funds invested in education did not bring the desired effects in the form of receiving a qualified employee with a diploma confirming professional qualifications. This means that almost 6 million PLN has been badly invested, and the labor market instead of receiving 3,500 qualified shippers was supplied to just under 2,500 people. In the case of this vocational training, over 17.5 million PLN was invested, of which about 6 million did not bring the desired effects (Tab. 4).

Table 5 presents the results of vocational exams for the second qualification A.44, i.e.: organization and running of trains for the profession of rail transport technician. It is a profession that is characterized by very low pass rate of exams, especially for the qualification discussed. The average pass rate for the discussed qualification in the discussed period is only at the level of 10%. This means that the estimated outlays on the education of all persons taking an A.44 qualification exam in the period from September 2014 to July 2018 only paid in 10%, which gives almost 8 million PLN of ill-used funds from the state budget. It also means that the railway services market has not been supplied to 1,500 employees. It should be noted that this sector is very much looking for these employees.

Table 3. Estimated costs of education of pupils/students who took the exam confirming their qualifications in the occupation in 2013–2018

No.	Month and year of the exam	The written and practical part of the exam in total			The cost of education for pupils / students who have taken examinations confirming their qualifications in the profession		
		took the exam	passed	pass rate (%)	for all pupils / students who took the exams [PLN thous.]	for pupils / students who have passed the exam [PLN thous.]	for pupils / students who have not passed the exam [PLN thous.]
1	August-September 2013	444	416	93,69	2,220	2,080	140
2	October-November 2013	2,105	1,258	59,76	10,525	6,290	4,235
3	January-February 2014	24,149	12,984	53,77	120,745	64,920	55,825
4	June-July 2014	118,489	76,482	64,55	592,445	382,410	210,035
5	August-October 2015	14,957	10,404	69,56	74,785	52,020	22,765
6	January-February 2016	164,026	116,140	70,81	820,130	580,700	239,430
7	May and June 2016	1,324	1,306	98,64	6,620	6,530	90
8	June-July 2016	239,074	181,118	75,76	1,195,370	905,590	289,780
9	August-October 2016	13,209	8,952	67,77	66,045	44,760	21,285
10	January-February 2017	157,470	114,281	72,57	787,350	571,405	215,945
11	May and June 2017	1,568	1,519	96,88	7,840	7,595	245
12	June-July 2017	241,301	188,274	78,02	1,206,505	941,370	265,135
13	January-February 2018	158,508	114,311	72,12	792,540	571,555	220,985
14	May and June 2018	1,587	1,579	99,50	7,935	7,895	40
15	May and June 2018	243,970	188,279	77,17	1,219,850	941,395	278,455
16	The years 2015/2018 in total	1,382,181	1,017,303	73,60	6,910,905	5,086,515	1,824,390

Source: own study based on CKE reports (CKE, 2014; 2015; 2016; 2017).

Table 4. Estimated costs of education of pupils / learners in the profession of a freight forwarder technician who took the exam confirming their qualifications in the occupation in 2015–2018

Month and year of the exam	Qualification designation	Name of the qualification	Name of the profession in which the given qualification was distinguished	Passing the exam			The cost of training students / students who took exams confirming their qualifications in the profession		
				pass rate of the written part (%)	pass rate of the practical part (%)	pass rate of the exam (%)	for all pupils / students who took the exams [PLN thous.]	for pupils / students who passed the exam [PLN thous.]	or pupils / students who have not passed the exam [PLN thous.]
IX – X 2015	A.29	Service for clients and contractors	333108 – freight forwarder technician	100.00	100.00	100.00	5	5.00	0.00
I – II 2016				95.00	69.00	69.00	4370	3015.30	1354.70
V – VII 2016				98.84	74.71	74.42	430	320.00	109.99
VIII – XI 2016				95.24	60.00	72.22	90	65.00	25.00
I – II 2017				96.35	54.39	55.31	5180	2865.06	2314.94
VI – VII 2017				96.98	21.15	21.65	970	210.00	760
I – II 2018				98.99	81.28	81.31	5405	4394.81	1010.19
VI – VII 2018				98.45	66.12	76.09	1150	875.041	274.97
Total				97.48	65.83	68.75	17600	11750.21	5849.79

Source: own study based on CKE reports (CKE, 2014; 2015; 2016; 2017).

Table 5. Estimated costs of education of pupils / students in the profession of railway transport technician who took the exam confirming their qualifications in the years 2014–2018

Month and year of the exam	Symbol of the qualification	Name of the qualification	Name of the profession in which the given qualification was distinguished	Number of people taking the exam			Pass rate of the exam			Cost of education of pupils / students who took exams confirming their qualifications in the profession		
				written part	practical part	Exam in total	pass rate of the written part	pass rate of the practical part	pass rate of the exam	for all pupils / students who took the exams [PLN thous.]	for pupils / students who passed the exam [PLN thous.]	for pupils / students who have passed the exam [PLN thous.]
I – II 2014	A.44	Organization and operation of trains	311928 - Railway transport technician	13	13	13	100.00	0.00	0.00	65	0.00	65
V – VII 2014				77	77	77	89.61	33.77	33.77	385	130.02	254.99
IX – X 2015				0	9	0	0.00	33.00	0.00	0	0.00	0.00
I – II 2016				46	112	34	9.00	28.00	6.00	170	10.20	159.80
V – VII 2016 r.				178	177	173	35.39	7.34	4.05	865	35.03	829.97
VIII to XI 2016				38	65	30	7.89	0.00	0.00	150	0.00	150
I – II 2017				96	137	90	10.42	47.45	5.56	450	25.02	424.98
VI – VII 2017				392	402	373	46.43	22.64	17.16	1865	320.04	1544.97
I – II 2018	316	393	267	24.68	24.43	13.11	1335	175.02	1159.98			
VI – VII 2018	590	598	508	52.37	4.01	4.13	2540	104.90	2435.1			
Total	1746	1983	1565	41.75	20.06	9.31	7825	800.22	7024.78			

Source: own study based on CKE reports (CKE, 2014; 2015; 2016; 2017).

Conclusions

Based on the observations and analyzes carried out, it can be seen that the Polish vocational education system generates high costs of maintaining one student in the vocational education system, which does not translate into the expected effects. High expenditures do not go hand in hand with high passing of examinations confirming qualifications in the profession. This situation results from many reasons. These include: continuous changes in curricula, lack of proper teacher training, insufficient cooperation between schools and employers, lack of employers' influence on the functioning of the vocational examination system in Poland, low motivation of students/learners to deepen their knowledge and lack of properly supervised generation system creation of examination tasks, as well as absence of actions by authorized bodies in the event of a low pass rate for a given profession aimed at raising its level.

The current system of examination and vocational training in Poland functions in a way that requires corrective action. These activities should aim at making the examination system more flexible, with an emphasis on the increased role of employers, especially in the examination process. It is important that the education system should also be aimed at expanding cooperation with employers towards dual education. Employers who expect a particular employee with specific skills should have a greater opportunity to create educational and examination reality.

In summary, the concept of cost analysis is very simple, which does not mean that it is easy to use. The problem may be both the estimation of the expenditure and the effect. The use of cost-effectiveness analysis in assessing the efficiency of outlays incurred on education, including expenditures incurred on vocational training is sometimes complicated and controversial, but it is an indispensable component of the evaluation of vocational education along with the examination system. Without this assessment, the vocational education system may not only be ineffective and very expensive, but above all, due to its inertia, it cannot create adequately qualified personnel, which translates directly into the generation of losses in the Polish economy.

As results from the conducted analyzes (research), the obtained ratio of incurred expenditures to effects, which is unfavorable for the described education system, is also significant. It is difficult to accept the fact that over 25% of funds allocated to vocational education do not bring the desired results. It is even more difficult to accept investing funds in vocational training in industries in which the effectiveness of invested financial resources is at the level of 10%. In connection with the above, there is a necessity to carry out extensive research, which will allow to answer the question on where to place the center of gravity of expenditures on vocational education and the received learning outcomes.

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