

## EXPECTATIONS OF THE POLISH STAKEHOLDERS TOWARDS THE SKILLS AND KNOWLEDGE OF THE GRADUATES AS REGARDS ORGANIC FOOD AND FARMING

### Summary

*The aim of this paper was to analyze the Polish stakeholders from the organic sector in terms of their expectations towards the potential employees and to evaluate what kinds of the professional knowledge and skills are expected by the employers. A survey with stakeholders from the organic food chain was carried out in 2015 in Poland. The investigation has been conducted within a European project "Innovative Education towards the Needs of the Organic Sector" (<http://epos-project.net/>). A questionnaire with closed-ended questions was created in order to cover a range of different stakeholders. The survey consists of 72 records. Five groups of thematic points were chosen for the publication: (A) Type of graduate for optional employment, (B) Profile of disciplines of graduates, (C) Strategies for recruitment of graduates, (D) Requirements of the job, (E) Innovations in teaching methods. The results indicate that Polish enterprises within organic sector are interested in employing the graduates in organic food and farming studies. There is a need in Poland to create well-constructed university study programs covering organic food and farming. It is necessary to introduce innovative educational methods into the above programs in order to provide the alumni possibilities to acquire skills desired by the employers. Cooperation with enterprises within organic sector is a necessary element of the new created programs as the method to increase practical skills of the graduates and their possibilities to get an interesting job after graduation.*

**Key words:** stakeholders, organic production, innovative teaching methods, skills of graduates, organic food and farming studies

## OCZEKIWANIA POLSKICH PRZEDSIĘBIORCÓW CO DO UMIEJĘTNOŚCI I WIEDZY ABSOLWENTÓW W ZAKRESIE EKOLOGICZNEJ ŻYWNOŚCI I ROLNICTWA

### Streszczenie

*Celem tej pracy była analiza polskich przedsiębiorców z sektora ekologicznego pod względem ich oczekiwań wobec potencjalnych pracowników i ocena, jakie rodzaje profesjonalnej wiedzy i umiejętności są oczekiwane przez pracodawców. Ankieta z polskimi przedsiębiorcami z sektora ekologicznego została przeprowadzona w roku 2015 w ramach projektu Europejskiego "Innovative Education towards the Needs of the Organic Sector" (<http://epos-project.net/>). Kwestionariusz z pytaniami zamkniętymi stworzony został w celu zbadania różnych przedsiębiorców. Przebadano 72 osoby. Pięć grup tematycznych zostało wybranych do publikacji: (A) typ absolwenta do ewentualnego zatrudnienia, (B) profil absolwentów, (C) strategia rekrutacji absolwentów, (D) wymogi pracy, (E) innowacje metod nauczania. Wyniki wskazują, że polscy przedsiębiorcy z sektora ekologicznego są zainteresowani zatrudnianiem absolwentów studiów o kierunku ekologiczna żywność i rolnictwo. Istnieje w Polsce potrzeba stworzenia dobrze skonstruowanych programów studiów uniwersyteckich dotyczących ekologicznej żywności i rolnictwa. Zachodzi konieczność wprowadzenia do powyższych programów innowacyjnych metod nauczania w celu zapewnienia możliwości osiągania przez absolwentów umiejętności pożądaných przez pracodawców. Współpraca z przedsiębiorstwami sektora ekologicznego jest niezbędnym elementem nowych programów studiów jako metoda zwiększenia umiejętności praktycznych absolwentów i ich możliwości uzyskania ciekawej pracy po studiach.*

**Słowa kluczowe:** przedsiębiorcy, produkcja ekologiczna, innowacyjne metody nauczania, umiejętności absolwentów, studia w zakresie żywności ekologicznej i rolnictwa

### 1. Introduction

Organic production evolves rapidly across the whole world. According to latest data published in [20] in 2014 in Europe 11,6 million hectares of agricultural land were cultivated organically by almost 340 000 producers and 2,4 percent of the agricultural area was organic. The European countries with the biggest organic agricultural areas were: Spain (1,7 million hectares), Italy (1,4 million hectares) and France (1,1 million hectares). The sale of organic products in Europe was about 26,2 billion euros in 2014, with an increase by 7,6 percent compared to 2013. The largest markets for organic products in 2014 were: Germany (7.9 billion euros), next France (4,8 billion euros) and UK (2,3 billion euros).

It is clear that European organic food market is one of the most budding ones, and in order to reach a successful progress, the agricultural education is a basic factor [13]. As it has previously been proved, agricultural research and education in Europe has played a dominant role in the advancement of agriculture and land use over the last century [15]. Many European agricultural graduates are farmers [9] and the positive impact of their education on the prosperity of the farm households and their multifarious activities is visible [2].

However, the future of agricultural education cannot be only concentrated on agricultural enterprises and question of "how to produce". It needs a wide approach which includes environmental protection, nature conservation, ex-

pansion, geo-information systems, gardening, and all the trader aspects [13, 15].

The agricultural education has to evolve in parallel to the changes in the societies. This is a key issue according to some authors [11] who claim that agriculture is not sufficiently changing because it is dominated by the old fashioned patterns of the previous agricultural generations.

The younger generation has to be prepared for the changes in the agricultural and food production chains which are powered by more intensive economies. One of the important trends is organic food production chain connected with the food quality aspects and environmental and health tribulations. However, these issues are not enough implemented into the studies related to agriculture and food sciences. And according to some studies the economic status of the farmer depends on their ability to gain specific knowledge and to apply the new fashioned agronomic technologies [21, 12]. The aim of this paper was to analyse the Polish stakeholders from the organic sector in terms of their attitude towards the potential employees – what kind of the professional profiles, knowledge and skills are expected by the employers.

## 2. Material and methods

### 2.1. Survey procedures

A survey with stakeholders from the organic food chain was carried out in 2015 in Poland. The investigation has been conducted within a European project “Innovative Education towards the Needs of the Organic Sector” (<http://epos-project.net/>). The basic selection criterion was that all investigated stakeholders were certified organic producers according to the European Regulation n. 834/2007 concerning organic production and the labelling of organic products.

A questionnaire with closed-ended questions was created in order to cover a range of different stakeholders. The stakeholders were found in the national databases of the organic producers, and they have been reached mainly via electronic channels of communication (e-mails). The questionnaire has been validated in the pilot study conducted on 5 stakeholders in the beginning of the project. In the case of farmers the questionnaires have been mostly filled in through a direct contact. The questionnaire consisted of the five sections. The first part was the socio-economic identification of the respondents. They were asked about gender and age and then about the basic characteristics of their enterprises. The stakeholders were clustered in different categories: farmers, processors/retailers, consultancy/advisory, education, and public sector. The further information was required depending on the type of stakeholder. Among 72 stakeholders there were 20 farmers, 22 processors, 10 traders (in that retailers, wholesalers, and import / export traders), 5 advisors, 5 certifying units, 10 educators (mostly from the University). The same group of respondents has been surveyed across the whole study. All the respondents were asked about the number of years they have been involved in the organic sector and number of people employed in the business/enterprise. A second part covered the issues related to the willingness to employ a graduate in organic food and farming. The respondents were next asked to indicate their preference on the educational level of their employees (high school graduate, vocational school, bachelor, master degree, etc.). Moreover the stakeholders were

requested to rank in a 6-point scale the practical skills and theoretical knowledge they would await from graduates. The respondents were also asked about their level of contentment with the current skills of university alumni in organic production, and their preferences related to traditional or more innovative teaching methods. The last part of the questionnaire concerned the usefulness of the possible co-operation between the stakeholders and organic companies.

### 2.2. The sample

The survey consists of 72 records. Only the stakeholders being the potential employers have been surveyed in this study; the graduates themselves were not surveyed. Five groups of thematic points were chosen for the publication: (A) Type of graduate for optional employment, (B) Profile of disciplines of graduates, (C) Strategies for recruitment of graduates, (D) Requirements of the job, (E) Innovations in teaching methods. Due to missing distribution of normality all data provided in a score system from 1 (least) to 5 (most) were statistically evaluated by Kruskal-Wallis method completed by multiple comparisons according to Dunn-Bonferroni test. Minitab17© was used as statistical software. Column graphs were prepared by three sections (Disagree by score 1 and 2; No opinion by score 3; Agree by score 4 and 5). Evaluations were conducted by clustering of questions (a) per thematic point (b) per stakeholder.

## 3. Results

The estimates about the preferred degree levels of graduates resulted in clear differentiations (see figure 1 and table 1 and 2), the doctorate degree was mostly rejected among the stakeholders, similar to the High School degree and were significantly different from the positive estimates for the degree levels of a master study, a bachelor study and a more practice-based education of Vocational Schools (>60% agreement). According to these responses they are actually interested in the alumni more skilled by practical experiences than in those with academic background

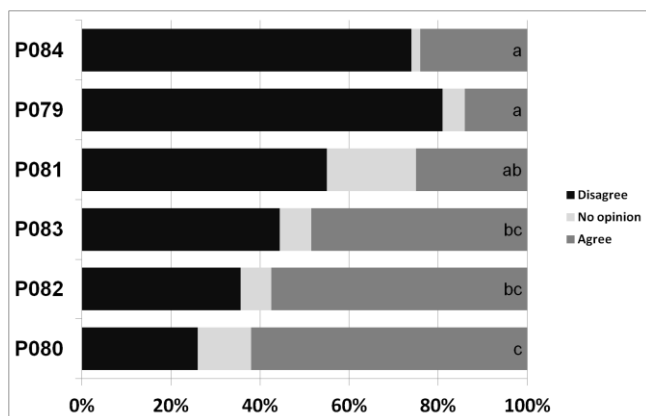
Table 1. Question: Are you planning to employ such graduates?

Tab. 1. Pytanie: Czy planuje Pan / Pani zatrudnić takich absolwentów?

Code	Degree
P079	High school degree
P080	Vocational school degree
P081	Polytech / College graduation
P082	Bachelor degree
P083	Master degree
P084	Doctorate certificate

Source: own work / Źródło: opracowanie własne

Among the stakeholders the votes of processors and farmers could be separately calculated against of the group including all the other stakeholders. These two groups distinctly disagreed (>70 %) against the necessity of a doctorate degree for their optional new employees (see table 2: P084). Vice versa, their estimate for the mostly accepted degree level (vocational school) was logically significantly different to the one of others (see table 2: P080).



\* different letters stand for significant differences according to Dunn Bonferroni Test for multiple comparisons of Kruskal-Wallis evaluations, / \*różne litery świadczą o istotnych różnicach zgodnie z testem Dunn Bonferroni dla wielokrotnych porównań oceny Kruskal-Wallis

Source: own work / Źródło: opracowanie własne

Fig. 1. Estimates of questions about preferred degree of graduates for employment (Summary of all interviews per country with a scored system of reply (1 to 5, from the worst to the best, 1 and 2= I disagree, 3=no opinion, 4 and 5=I agree)

Rys. 1. Wyniki pytania na temat preferowanego stopnia naukowego absolwentów do zatrudnienia (suma wszystkich odpowiedzi z kraju z rankingiem odpowiedzi (1 do 5, od najgorszego do najlepszego, 1 i 2= nie zgadzam się, 3= brak zdania, 4 and 5 = zgadzam się)

Table 2. Evaluations of country-data for the degree of graduates (P084: doctorate degree and P080: vocational school degree) (O = Other stakeholders, F = Farmers, P = Processors, S = Salesmen)

Tab. 2. Ocena danych krajowych dla stopnia naukowego absolwentów (P084: stopień doktora i P080: absolwent szkoły zawodowej) (O = inni stakeholderzy, F = rolnicy, P = przetwórcy, S = handlowcy)

Code	Stakeholder	I disagree	I agree	z value	DB
P084	P	0.80	0.20	-2.04	a
	F	0.75	0.00	-0.55	a
	O	0.20	0.80	2.59	b
P080	O	0.36	0.36	-2.76	a
	S	0.12	0.88	0.04	ab
	P	0.05	0.84	0.87	b
	F	0.22	0.69	0.98	b

Source: own work / Źródło: opracowanie własne

Table 3. Question: What kind of theoretical knowledge in the field of organic food and farming do you expect from graduates?

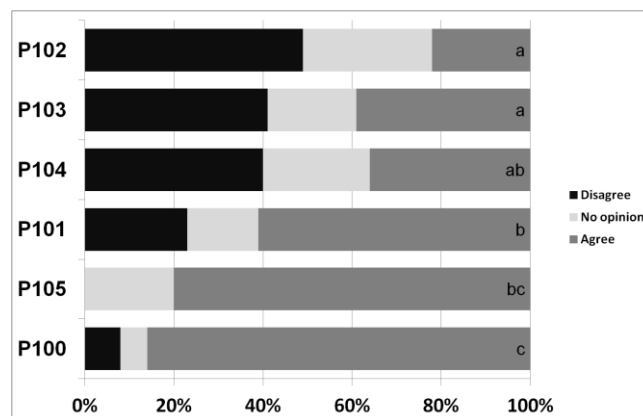
Tab. 3. Pytanie: Jakiego rodzaju wiedzy teoretycznej w zakresie ekologicznej żywności i rolnictwa oczekuje Pan / Pani od absolwentów?

Code	Degree
P085	Plant production
P086	Plant protection
P087	Animal production
P088	Veterinary science
P089	Food quality
P090	Food technology
P091	Biotechnology
P092	Nutrition and health

P093	Marketing
P094	Legislation
P095	Economy
P096	Finances
P097	Arithmetics

Source: own work / Źródło: opracowanie własne

Among mostly rejected answers, the response concerning veterinary sciences the highest degree of disagreement was given by the group of processors, significantly different to the reaction of public service personal, others and farmers. In contrast to that food technology was scored by high levels of agreement between 57 and 100 %. No significant difference between the various stakeholder groups could be found.



\* different letters stand for significant differences according to Dunn Bonferroni Test for multiple comparisons of Kruskal-Wallis evaluations / \*różne litery świadczą o istotnych różnicach zgodnie z testem Dunn Bonferroni dla wielokrotnych porównań oceny Kruskal-Wallis

Source: own work / Źródło: opracowanie własne

Fig. 2. Estimates of questions about strategies of recruitment for the employment of graduates (Summary of all interviews per country with a scored system of reply (1 to 5, from the worst to the best, 1 and 2= I disagree, 3=no opinion, 4 and 5=I agree)

Rys. 2. Wyniki pytania na temat strategii rekrutowania absolwentów do zatrudnienia (suma wszystkich odpowiedzi z kraju z rankingiem odpowiedzi (1 do 5, od najgorszego do najlepszego, 1 i 2= nie zgadzam się, 3= brak zdania, 4 i 5 = zgadzam się)

The third cluster of questions was directed to questions about strategies of recruitment for the employment of graduates (see figure 2, table 4 and 5).

Table 4. Question: How do you recruit new employees?

Tab. 4. Pytanie: w jaki sposób rekrutuje Pan / Pani nowych pracowników?

Code	Degree
P100	I select people recommended by others
P101	I select from people I know
P102	I place an advertisement in the press
P103	I place an advertisement in the Internet
P104	I select from students/graduates who participated in the students internships or trainings organized in my enterprise / institution
P105	Other methods

Source: own work / Źródło: opracowanie własne

Table 5. Evaluations of stakeholder-data for the recruitment of new employees (P102: place in the press and P100: people recommended by others) (P = Processors, S = Salesmen, F = Farmers, O = other stakeholders)

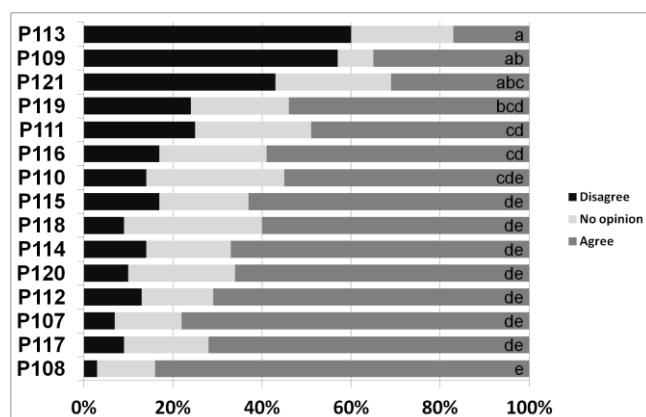
Tab. 5. Wyniki badania stakeholderów w zakresie rekrutacji nowych pracowników (P102: ogłoszenie w prasie i P100: osoby rekomendowane przez innych) (P = przetwórcy, S = handlowcy, F = rolnicy, O = inni stakeholderzy)

Code	Stakeholder	I disagree	I agree	z value	DB
P102	F	0.53	0.29	-2.45	a
	O	0.42	0.35	-0.47	ab
	P	0.14	0.45	2.55	b
P100	F	0.05	0.95	-1.04	a
	O	0.07	0.83	-0.84	a
	S	0.00	1.00	0.69	a
	P	0.00	0.97	1.12	a

Source: own work / Źródło: opracowanie własne

The overall evaluation of six answers (P100 to P105) resulted in a significantly agreeing attitude in the context of personal contacts and/or recommendations (P101, P100, P105) from 60 to >80%, which was contrasted by the evaluations of anonymized strategies of announcement through newspapers and digital networks, significant differences to the three other mentioned approaches. Among the stakeholder groups farmers mostly disagreed to non-personal strategies (see table 6A: 53%). The personal approach was highly agreed by all stakeholder groups (see table 6B: between 83 and 100%), therefore statistically not different.

Cluster four dealt with the skills of graduates they should have to be attractive for employment (see figure 3, table 6 and 7).



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Source: own work / Źródło: opracowanie własne

Fig. 3. Estimates of questions about skills demanded of graduates (Summary of all interviews per country with a scored system of reply (1 to 5, from the worst to the best, 1 and 2 = I disagree, 3 = no opinion, 4 and 5 = I agree)

Rys. 3. Wyniki pytania na temat umiejętności wymaganych od absolwentów (suma wszystkich odpowiedzi z kraju z rankingiem odpowiedzi (1 do 5, od najgorszego do najlepszego, 1 i 2 = nie zgadzam się, 3 = brak zdania, 4 i 5 = zgadzam się)

Table 6. Question: What kind of skills do you expect from your employees?

Tab. 6. Pytanie: Jakiego rodzaju umiejętności wymaga Pan / Pani od swoich pracowników?

Code	Degree
P107	Theoretical knowledge
P108	Practical expertise
P109	Ability to work in a lab
P110	Computer skills
P111	Knowledge of MS Office as a user
P112	Ability of searching for information in the Internet
P113	Knowledge of other specific computer software (statistics, budget etc.)
P114	Communication skills to work with clients
P115	Team working skills
P116	Analytical/problem solving skills
P117	Foreign language skills
P118	Ability to adapt/act in new situations
P119	Ability to work under time pressure (working to deadlines)
P120	Ability to innovate and create
P121	Knowledge of the existing mechanisms of financial support for enterprises

Source: own work / Źródło: opracowanie własne

Table 7. Evaluations of stakeholder-data for the combined answers concerning requirements for the job, (P113: specific computer software and P108: practical expertise) (P = Processors, S = Salesmen, F = Farmers, O = other stakeholders, Pu = Public service, E = Educator)

Tab.7. Wyniki danych nt. stakeholderów dla połączonych odpowiedzi nt. wymagań odnośnie zatrudnienia (P113: znajomość specyficznych programów komputerowych i P108: doświadczenie praktyczne) (P = przetwórcy, S = handlowcy, F = rolnicy, O = inni stakeholderzy, Pu = urzędnicy państwowi, E = nauczyciele)

Code	Stakeholder	I disagree	I agree	z value	DB
P113	P	0.63	0.17	-2.55	a
	F	0.41	0.24	-0.85	ab
	S	0.31	0.31	0.43	ab
	E	0.27	0.45	0.97	ab
	O	0.07	0.53	1.72	b
	Pu	0.13	0.31	2.10	b
P108	P	0.00	0.86	-1.60	a
	E	0.11	0.56	-1.04	ab
	F	0.02	0.91	-0.35	ab
	O	0.00	0.90	0.26	ab
	Pu	0.00	1.00	1.06	ab
	S	0.00	1.00	2.26	b

Source: own work / Źródło: opracowanie własne

Three answers mostly disagreed by all stakeholders were again those skills and abilities which obviously were outsourced in case of need; knowledge of computer software, ability of work in a lab, knowledge about financial affairs. The answers which were significantly different from those three options covered a wide range of skills: partly of theoretical background i.e. theoretical knowledge and foreign languages, partly of practical background i.e. practical experience, ability to act in new situations, ability to innovate and create. The differentiation between entrepreneurs has to be noticed: the highly disagreeing reaction of processors (see table 7: P113) was significantly different from the agreeing response of others and public servicemen. Within

the positive response in P108 the processor's opinion (86% agreement) was significantly different from the one of salesmen (100%). The level of agreement ranged from 56% from educators till 100% from public servicemen and salesmen.

Cluster No 5 was dedicated to teaching and learning methods during the study of graduates. Answer P129 (Learning by cooperation with enterprises) achieved the highest level of agreement (90%) and significantly differed from the results of two other answers. The group of farmers was more sceptical towards the potential success of problem-solving strategies whereas the group of processors was significantly more confident in that learning approach. Although the approach of project-oriented team working resulted in similar responses by three groups of stakeholders, the statistical figures did not allow any differentiation between their responses. Processors were less and farmers most confident in that approach.

#### 4. Discussion

There is a very sparse information published about the expectations of the potential employers in organic sector towards the skills and knowledge of the alumni. The presented study shows that 51% of stakeholders would like to employ graduates educated in organic food and farming and 38% of them are planning to do so in next 3 years.

The most attractive for the employers is vocational education, next BSc and MSc studies, and the least – doctorate studies. This output is not blindsiding in the light of the practical profile of the activities in the organic enterprises.

British data indicate that organic farming is positively influencing a demand for the employees - in the UK it provides 32% more jobs per farm than equivalent conventional farms [4]. It is positive because a demand for work in UK's agriculture has decreased by 80% in the last 50 years. Organic farming is helping to retract a drop in the UK's agricultural workforce, which has descended. Organic farmers are significantly younger than their non-organic colleagues; they are also definitely more involved in different innovative non-productive enterprises, such as on-farm processing or direct marketing. It has been confirmed also in Poland by [17] who proved that Polish organic farmers often conduct non-agricultural activities such as marketing, mechanization services, on-farm processing and agro tourism.

Sawicka and Umachandran [16] present the opinion that organic farmers possess high knowledge and skills in the economic aspects because they participate often in such dissemination activities as workshops, open days and training courses. The regular non-organic farmers present much lower interest and knowledge in the sustainable production methods as has been proved for Polish farmers by [5]. Therefore it can be concluded that higher education in the field of organic food and farming should help to increase the employment and economic activity in the rural areas. Wheeler's study [19] documents that professionals with larger organic know how and experience will presumably think more positively about organic farming. Therefore it is valid to upgrade the level of professional knowledge among the workers in organic sector as well as among the consumers of organic food. According to [14] just a 50-minute lecture about organic agriculture changed the insight of the students about organic food. It is very useful to inform the young generation about organic food and farming because

the average level of knowledge in this matter is still rather low in many societies. According to [10] about 50 % of Polish students knew the main principles of the organic production but only 20-39 % of students used to buy organic food. The biggest obstacle was in high price of organic food, lack of knowledge about the organic food market and low availability of these products.

Hilimire and Mc Laughlin [7] report that food systems and related programs are more and more offered at post-secondary schools. The authors declare that that surveyed students were interested in alternative food systems with a lustful emphasis on organic methods. Students were also concerned in the impact of food chains on health, environmental sustainability and social justice.

According to own data the Polish employers believe that the most desirable knowledge of alumni is food technology, food quality, plant production and protection and marketing. The last demand is fully understandable because in Poland the main problem of organic sector is how to increase the consumer demand and sell of the organic products [1]. So, the employers expectations are symptomatic and should be taken into consideration by the authorities responsible for the educational programs at universities. Unfortunately, there are no published results in Poland and EU to be compared with these results.

The presented study has exposed that the Polish companies are looking for the new employees primarily via recommendation from the professional acquaintances and colleagues, and to less extend through the press announcements. Parallel results were found by Urbancova [18] - agricultural enterprises in Czech Republic mostly select their workers basing on recommendation, training their own employees or recruiting talented students who want to work in agriculture at secondary schools or colleges.

According to own studies, Polish employers from organic sector think that the most attractive skills of the alumni are practical skills, theoretical knowledge, ability to search in Internet and foreign language, next communication skills and ability to innovate and create. According to [8] Polish employers regard as the most important the following skills; ability to learn, specialist knowledge, fluency in foreign languages, effective work with others, analytical thinking, fluency in computer usage and Internet. The next desired skills are ability to work under pressure, ability to clear transfer of information, ability to grasp new possibilities, effective use of time, ability to cooperate with people form different culture groups, innovativeness, ability to coordinate activities.

One can conclude that the expectations of Polish employers in organic sector and generally are similar except practical skills which are especially important in agriculture and food production chain.

The own results show baldly that innovations in teaching / learning process are indispensable within organic food and farming education. Most (90%) of Polish stakeholders think that the best method consists in learning by cooperation with enterprises, next (63%) learning by defining and solving problems and finally (47%) learning by team working. It is consistent with the general expectations of the Polish employers – such educational methods can create alumni with desired skills necessary in the modern enterprises.

There are some attempts of the innovative education in Poland. One of interesting examples is described by Gawel

and Pietrzykowski [3]. The authors consider that developing entrepreneurship is one of the important national objectives as a known factor abating economic development and competitiveness of enterprises and regions. The authors have introduced an innovative teaching method at University level. The results indicated that new teaching methods had improved the perception of entrepreneurship and increased the progress of entrepreneurial intention among the students.

Ecological education is recognized also in Poland as fundamental [1]. In author's opinion it is particularly important to stimulate environmental awareness of young people, as well as the preparation of school staff to implement a series of methods and strategies for getting the best results in the process of education of the young generation. However the education programs strictly related to organic food and farming are still very rare in Poland and in Europe. According to Hilimire [6] the conventional agriculture education programs and even sustainable agriculture programs, rarely cover food systems with global and socio-cultural perspectives. The author has prepared a curriculum for an undergraduate-level Sustainable Food Systems program. The developed courses are experiential, interdisciplinary, field-based and project-based. Hilimire [6] has proved that students taking part in this program evolved high critical thinking skills around values-based complicated issues and were able to find answers for difficult problems of food systems.

## 5. Conclusions

1. Polish enterprises within organic sector are interested in employing the graduates of organic food and farming studies.
2. There is a need in Poland to create well-constructed university study programs covering organic food and farming.
3. There is a necessity to introduce innovative educational methods into the above programs in order to provide the alumni possibilities to acquire skills desired by the employers.
4. Cooperation with enterprises within organic sector is a necessary element of the new created programs as the method to increase practical skills of the graduates and their possibilities to find an interesting job after graduation.

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