

---

## Analysis of Factors Influencing the Teamwork Competences of Managers Starting their Professional Career

---

Submitted 30/09/21, 1st revision 15/10/21, 2nd revision 03/11/21, accepted 10/12/21

Marek Goliński<sup>1</sup>, Dorota Bączkiewicz<sup>2</sup>

**Abstract:**

**Purpose:** The aim of this article is to investigate the relationship between the features that may affect the development of teamwork of students (future managers) who start their professional career. For the purposes of human resource management - employment and development of employees, it is important which of the social competences and to what extent strengthen the competence of teamwork.

**Design/Methodology/Approach:** The analysis was based on research carried out over 2 years (2017-2018) on a random sample of 265 university students. The method used in the research was a survey. The actual research was preceded by pilot studies validating the research tool and the scope of research issues - including the comprehensibility and unambiguity of questions. In the study and verification of the relationship, parametric tests were used, and to demonstrate the interactions between the factors, multivariate adaptive regression with the use of spline functions (MARS). Based on the obtained results, a mathematical model of the influence of the researched factors on the teamwork competence was proposed.

**Findings:** The research results show a strong mutual dependence of social competences - the strongest impact on teamwork competences was (in particular, team management), conflict resolution competences, organizational skills, communication with the environment and strategic thinking. The analyzes contained in the article show that the study and then the improvement of employee competences should always be considered comprehensively and look for groups of mutually reinforcing competences.

**Practical implications:** Research results can be a practical tool used in the recruitment and improvement of the company's managerial staff. The results of the research allow the management staff to improve selected managerial competences and at the same time to increase the market competitiveness of the entire enterprise.

**Originality / Value:** Most of the articles in competency research focus on the analysis of a selected feature and its impact on, employment opportunities or the effectiveness of tasks performed. The article supplements the subject of personnel management by filling the cognitive gap regarding the mutual dependence of social competences that affect the effectiveness of the enterprise. The proposed model describes the level of team management competences in relation to other social competences enriches the choice of methods and tools for personnel management.

**Keywords:** Human resource management, teamwork competences, professional skills, social competences, adaptive regression.

**JEL codes:** M2, M51

**Paper Type:** Research article.

---

<sup>1</sup>Poznan University of Technology, Faculty of Engineering Management, Institute of Safety and Quality Engineering, [marek.golinski@put.poznan.pl](mailto:marek.golinski@put.poznan.pl);

<sup>2</sup>Poznan University of Technology, Faculty of Automatic Control, Robotics and Electrical Engineering, Institute of Mathematics, [dorota.baczkiewicz@put.poznan.pl](mailto:dorota.baczkiewicz@put.poznan.pl);

## 1. Introduction

An important problem of recruiting employees, managing teams of employees and at the same time achieving the assumed goal of the enterprise is the proper selection of employees' competences. It is important to indicate to both employers and future employees which competences will be important at work positions in the coming years. The following literature review indicates the most important factors shaping the future working conditions, at the same time emphasizing the type of competences sought.

The dynamic development of the economy, followed by the limitations caused by the COVID-19 pandemic and the related recession, resulted in major changes in employment processes (Macaluso, 2021; *The Future of Jobs ...*, 2020). Previous cases of recession in the economy and in the labor market (e.g., the financial crisis of 2008) can be used to quickly exit the current crisis and constitute an indication of the forms of preventive action (Kopp and Siegenthaler, 2019). The current situation on the labor market is most influenced by technological changes, digitization, and automation. Modern technologies also force changes in organization and relations between employees or in the scale of society between residents (Borseková and Graczyk-Kucharska, 2017; *The future of education ...*, 2018; Dauth *et al.*, 2021).

The issue of changes in competency management is noticed not only by enterprises and employees, but also by several institutions responsible for the labor market and education. In 2018, the Council of the European Union approved the right of every person to quality education and lifelong learning to maintain and acquire skills that enable them to participate in society and deal effectively with changes in the labor market (White Paper ..., 2017; European Parliament ..., 2018). Universities educating future managers are aware that, instead of a narrow specialization, they will need: skills and attitudes that guarantee a smooth transition from the level of education to the workplace, the ability to develop further and adapt to job requirements on an ongoing basis. The offer of universities is changing, both in terms of education programs and methods of adapting to the needs of the labor market (Kolmos *et al.*, 2015; Kuráth and Sipos, 2021). Many universities already want to develop core skill sets that emphasize competences such as communication, teamwork, creativity, and interdisciplinary competence. This is especially true of technically oriented schools, whose graduates will enter a world conducive to innovation and collaborative organizations (Segerstrale, 2019).

Education in the field of technical education plays a key role in complementing and updating the educational offer adapted to the requirements of the labor market and demographic trends (Martensen and Grønholdt 2009; Spychała and Butlewski, 2016; E2030: Education and Skills ..., 2017). The educational offer must consider the education of competences sought by the market; therefore, a lot of emphasis is placed on the practical aspect of teaching (Neelam, 2018; Urquía-Grande and Pérez Estébanez, 2020) and taking into account the expectations of students towards universities - not only in terms of employment guarantees (James and Yun, 2018).

Professional development of university graduates - future managers - must be based on the sustainable development of the economy and its indicator, while considering the

relationship between productivity and well-being of employees (Tordera *et al.*, 2020). This is related to the need to have appropriate competences, which also affect the earnings and roles played in the organization, a particular differentiation is visible in relation to the competences discussed in this article, teamwork competences, conflict resolution competences, organizational skills or equally important competences related to strategic thinking (García-Aracil *et al.*, 2018; Håkanson *et al.*, 2020).

This publication indicates the need to analyze competencies in a wide range and consider the relationships that mutually strengthen selected competences, this is reflected in the literature, especially in relation to digital competences, entrepreneurial skills or teamwork competences (Spychała and Branowska, 2017; Coduras *et al.*, 2016; Almerich *et al.*, 2020).

A factor influencing the adaptation to the requirements of the labor market in terms of acquiring competences is also increasing mobility - internationalization and preparation for cultural diversity of students, regardless of the profession they will perform in the future (Blankvoort *et al.*, 2019). It is also connected with building a regional consensus in the field of information on competency needs, which will be made available to avoid comparisons and competition between countries (Szafranski and Erickson 2020).

The above literature review shows the substantive conditions based on which the research was conducted to verify the research hypothesis of this article, assuming that there is a mutual connection between competences that are important in the current labor market. The literature analysis also confirms the selection of competences that were considered in the research. The next chapter focuses on the competences of teamwork and its links with the labor market and education.

## **2. Teamwork as an Important Factor of Managers' Competences**

The issues of competence and motivation have been the subject of research for many years (McClelland, 1971). This applies to various areas of life - the benefits of team learning at the university as well as in the workplace are recognized to increase productivity (Colbeck *et al.*, 2000). This is conditioned by the needs of the developing economy, as many institutions (e.g., enterprises, universities) increasingly consider the role of teamwork in order to improve the productivity of study and work (Brodin, 2014; European Commission, 2017). The development of appropriate competences also affects the earnings and roles performed in the organization, a particular differentiation is visible in relation to digital competences, but also in the case of team management and project management (Crawford, 2005; Clarke, 2010). The predominant criterion of the effectiveness of activities in enterprises requires having appropriate competences in the assessment of management efficiency. This is visible in the assessment of the sought competencies in managerial positions (Varajão *et al.*, 2019).

The selection of appropriate competences, including the ability to work in a team, has an impact both on the implementation of the company's financial result, for example by increasing the company's intellectual capital (Salvi *et al.*, 2020), as well as on shaping the organizational structure of the company (Paul and Anantharaman, 2003).

Employees have competences related to teamwork skills in connection with creativity, commitment and entrepreneurship confirms a positive impact on the development of the company (Raine and Pandya, 2019; Daniel and Almeida, 2020). A positive aspect resulting from the ability to work in a group is also the ability to resolve conflicts and achieve job satisfaction (De Dreu and Van Vianen, 2001), which is an important factor in the sustainability of employment. Job satisfaction, which translates into a reduction in employee fluctuation, is influenced by another aspect related to working in a group, i.e., proper motivation and building proactive attitudes among employees (Pagani *et al.*, 2019; Napolitano *et al.*, 2020). The issues of proper group work are also reflected in the ability to resolve conflicts. Having the right competencies not only leads to the possibility of resolving conflicts but can often be a constructive aspect of group work (Correia, 2020). However, to achieve such results, the role of people managing the company's personnel is important, including appropriate talent management (Vaiman *et al.*, 2012), which also includes the ability to motivate young employees (Graczyk-Kucharska, 2019).

### 3. Research Conducted

#### 3.1 Research Assumptions

Statistical analyzes were performed with the use of statistical programs using the R and Python languages. The study was conducted in 2017-2018 on a group of 265 full-time and part-time students. The research was carried out based on an indirect survey and a questionnaire method, and the research tool was a self-assessment questionnaire. All analyzed competences were described with synthetic measures based on 3 indicators, which assessed competences in three dimensions, knowledge, skills, and attitudes related to a given competency. Each of the questions about the assessment of knowledge, skills, results, and the importance of individual factors in the development of the student's managerial competences could be answered on a scale from 1 to 8. To minimize inaccuracies related to subjective self-esteem, the exact characteristics should be described in words to indicate a specific level of your knowledge or skills. Most often, ordinal scales with more than 5 possibilities are treated as continuous scales (Węziak-Białowolska, 2011). Such an assumption was also made in the analysis below. It allows the use of an average to relate the values of several indicators describing a given competence.

The analysis of the competences of managing a team of employees was undertaken regarding 9 other competences and 11 features, among which there was, among others, seniority, and university results. Table 1 shows their symbols and the corresponding variables.

**Table 1.** Marks of variables and the corresponding features

Symbol	Feature	Symbol	Feature
Y	Managing a team of employees	X11	Student's assessment to what extent the internships and internships helped to develop managerial skills
X1	Creative thinking	X12	Student's assessment to what extent workshops and training courses helped develop managerial skills

X2	Solving the conflict	X13	Student's assessment to what extent student life helped develop managerial skills
X3	Organizational skills	X14	Student's assessment to what extent social life has helped to develop managerial skills
X4	Negotiation Skills	X15	Student's assessment to what extent family life has helped to develop managerial skills
X5	Communication skills ext.	X16	Student's assessment to what extent social activity has helped to develop managerial skills
X6	Communicating with the environment	X17	Work experience in months
X7	Strategic Thinking	X18	Grades in college
X8	Information management	X19	Activity in college
X9	The ability to take risks rationally	X20	Presence in college
X10	Student's assessment to what extent professional work helped develop managerial skills	X21	School performance

*Source: Own study.*

### **3.2 Results of the Survey on the Competences of Managing a Team of Employees**

The assessment of the competences of managing the Y employee team consists of the following features:

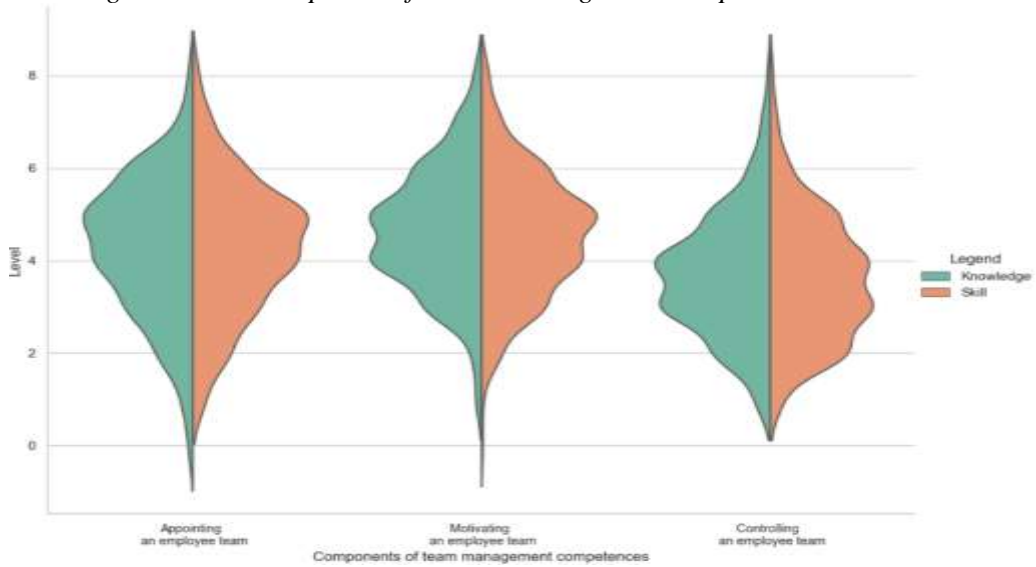
- Knowledge on how to set up a team of employees
- Ability to set up a team of employees
- Knowledge about motivating the employee team
- Ability to motivate the employee team
- Knowledge of how to control the employee team
- Ability to control the work team

The violin chart in Figure 1 shows the distribution of how individuals assessed their knowledge and skills.

It can be observed that the shapes of the probability distribution of skills knowledge practically do not differ from each other. The most probable level of competence to appoint an employee team and motivate it is approx. 5. However, the most probable level of competence to control an employee team is approx. 3-4.

The Kruskal-Wallis test showed that there are significant differences between groups of knowledge and skills. The first two charts practically do not differ from each other, and the third violin chart has the most likely results below. The significance of this difference was confirmed by the Dunn test with the Bonferroni correction. Thus, students assess the appointment of the employee team and its motivation as equal, but they assess significantly lowering the control of the team. This gives a signal to pay attention to the missing knowledge and skills in managing this feature.

**Figure 1.** Violin charts showing the probability distribution of responses on the knowledge and skills components for team management competences



*Source: Own work.*

### 3.3 Research Results – Statistical Analysis

Using the non-parametric adaptive regression method using MARS spline functions, a model was proposed that describes the level of competency in managing a team of employees on the basis of other features listed in Table 1.

The model consists of the following base functions:

$$h(x - t) = \max(0, x - t)_+ = \begin{cases} x - t, & \text{when } x > t \\ 0, & \text{in other cases} \end{cases} \quad \text{or}$$

$$h(t - x) = \max(0, t - x)_+ = \begin{cases} t - x, & \text{when } x < t \\ 0, & \text{in other cases} \end{cases}$$

where  $t$  is called a knot.

It was assumed that degree 2 interactions are permissible, i.e., a situation where, instead of a single base function, the component of the model is the product of two of them. The coefficients were determined using the least squares method to best fit the base functions and in compilations to the data. The model is as follows:

$$Y = \beta_0 + \sum_{m=1}^M \beta_m h_m(X),$$

where:

$\beta_0$  – intercept

$M$  – number of terms

$\beta_m$  –coefficients

The model was trained on 60% of the data and then tested on the remaining 40%. To avoid overtraining the model, GCV (Generalized Cross Validation) is used to remove the base functions or their interactions that have the least impact on improving the model. In order to determine the GCV, the penalty for adding another component to the model should be assumed. The following study adopted a  $c = 3$  penalty (Hastie *et al.*, 2001). For the set of test data, the trained model obtained a fit  $R^2 = 0.75$ , which we interpret as 75% of the feature variation is explained by the presented model. The individual components are described in Table 2.

**Table 2.** *MARS model components and coefficients*

Number of term	Term	Coefficient
1	Intercept	4,15
2	$h(5.5-X2)$	-0,40
3	$h(X3-2)$	0,38
4	$h(2.5-X7)$	-0,69
5	$h(3-X12)$	-0,18
6	$h(2-X3) * X12$	0,38
7	$h(X3-3) * h(5.67-X6)$	-0,26
8	$h(X7-2.5) * h(3-X11)$	0,11

*Source: Own work.*

To create the model, 6 variables were used, which in Table 3 were ranked in order from those having the greatest impact on improving the model to the least significant.

**Table 3.** *Important variables*

X2	X3	X6	X7	X12	X11
100	55,8	48,9	48,9	24,9	23,9

*Source: Own calculations.*

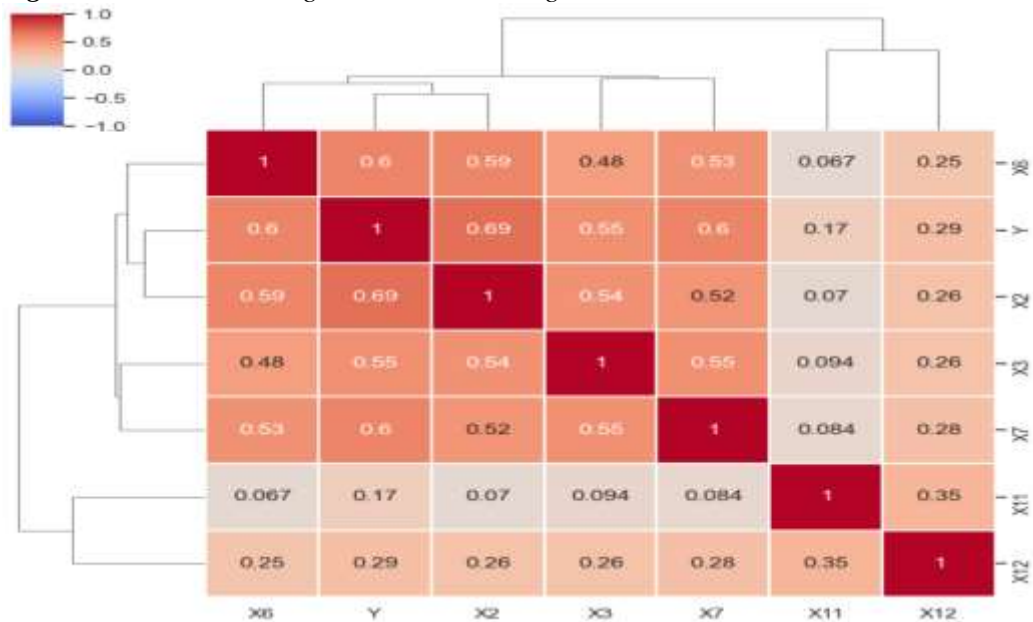
In the model, social competences turned out to be the most important: conflict resolution and organizational skills. In order to check the relationship between the significant variables and the competency of managing an employee team, the Spearman correlation was determined. Figure 2 shows a correlation diagram for a Spearman correlation matrix combined with a dendrogram obtained using the Euclidean metric and the nearest neighborhood method.

The more intense the color, the stronger the correlation between the variables. For the sample used  $n = 265$ , the Spearman correlation results greater than  $| 0.0593 |$  are significant at the significance level of 0.05.

It was shown that the strongest correlations occurred between the competence of managing a team of employees and conflict resolution. The competence of managing a team of employees is also strongly correlated with the competence of communicating with the environment and strategic thinking. A moderate correlation was obtained between the management of the employee team and organizational skills. The

dendrogram shows that social competences that were both significant in the MARS model and achieve high or medium correlations with the dependent variable are also clustered together. On the other hand, low, but significant correlations were shown between the student's assessment of the extent to which internships and internships, as well as workshops and training courses helped him develop the team management competence and the level of this competence.

**Figure 2.** Correlation diagram with the dendrogram



Source: Own work.

#### 4. Discussion

The analysis began with assumptions regarding the importance of teamwork competences and linking it with other competences. Critical analysis resulting from own research and supported by literature confirmed most of the adopted perspective. The aspect of comprehensiveness of the analyzed competences is particularly important due to the practical application of the research results. This is because employers are currently looking for graduates who are educated both technically and in terms of interpersonal competences. To meet these requirements, curricula must integrate interpersonal skills training into curricula (Halfhill and Nielsen, 2007; Kolmos *et al.*, 2015; Kuráth and Sipos, 2021). This is in line with the practical guidelines resulting from the conducted research.

Economic development is strictly dependent on the competences of employees. The requirements of continuous education and adaptation to the changing market environment are indicated in numerous reports and studies (The future of education ..., 2018; European Parliament ..., 2018; The Future of Jobs ..., 2020). The use of the results



obtained in this publication allows for the effective management of personnel in the enterprise by researching and then improving competencies that are useful in modern and developing enterprises.

The positive correlation of the analyzed competencies and employee characteristics, which are shown in the article, which relate to the management of an employee team, and thus have an impact on teamwork, may be helpful in avoiding conflicts in employee teams. The issues of conflict avoidance and the related issue of employee motivation are an important aspect of personnel management (Pagani *et al.*, 2019; Napolitano *et al.*, 2020; De Dreu and Van Vianen, 2001).

The conducted research was based on the self-assessment of the respondents. This approach is commonly used due to the speed of implementation, it is less accurate than, for example, the 360o method and there are publications showing e.g., discrepancies between self-assessments and their practical verification (Hack-Polay, 2020). However, in the conducted studies, its negative impact on the results was not verified, basing on studies that successfully applied the above method (Spychała, 2017; Szafrąński, 2019; Szafrąński, 2020).

## **5. Summary**

The aim of the research was to analyze the factors influencing the competences of managing a team of employees. The conducted research made it possible to verify the assumptions concerning the relationship between professional competences. Currently, the importance of teamwork and the related competences required plays a critical role in the labor market. It is also related to the fact that human capital is the resource that determines the competitiveness of a modern enterprise to the greatest extent. The article shows the relationship of competences that strengthen the ability to work in a team.

The statistical analysis of the probability distribution of the features influencing the competences of managing an employee team does not differ from each other. A practical hint is that future managers rate their knowledge of controlling the employee team lower, and therefore this feature requires improvement.

The main conclusion from the research was to determine which of the 9 competences examined and 11 features of future managers have the greatest impact on the management of the employee team. With a very high match, where for 75% of the variability of the features the obtained model was described, it was shown that the greatest addition correlates the team management competences with the conflict resolution competency, and then it is correlated with competences related to communicating with the environment and strategic thinking. The correlation of the above features using the MARS method was also positively verified by the Spearman correlation, which was illustrated on the dendrogram.

A limitation of the research was that the research was carried out based on self-esteem and at the stage of little professional experience of the respondents. The subjective assessment of competences should be verified, for example, based on the 360o method,

through an interview with the immediate superior and with colleagues. Regardless of that, thanks to the adaptive regression method, the study was compared with a larger sample, and the applied research method was adjusted to the sample size (Solon *et al.*, 2015; Spychała 2017).

Positive verification of the assumptions is both consistent with the results presented in the literature, but most importantly for the practice of teamwork management, it indicates which employee competences have the greatest positive impact on it. The results presented in the article have been verified in practice and used in research conducted by the author of this publication for the purposes of personnel management (Goliński and Miądowicz, 2019; Goliński and Szafranski, 2019).

## References:

- Almerich, G., Suárez-Rodríguez, J., Díaz-García, I., Cebrián-Cifuentes S. 2020. 21st-century competences: The relation of ICT competences with higher-order thinking capacities and teamwork competences in university students. *Journal of Computer Assisted Learning*, 36(4), 468-479. doi 10.1111/jcal.12413.
- Blankvoort, N., Kaelin, V.C., Poerbodipoero, S., Guidetti, S. 2019. Higher education students' experiences of a short-term international programme: exploring cultural competency and professional development. *Educational Research*, 61(3), 356-370.
- Borseková, K., Graczyk-Kucharska, M. 2017. Smart cities, smart organisations—similarity and differences. In *Proceedings of 6th Central European Conference in Regional Science-CERS*, 684-693.
- Brodin, E.M. 2014. Critical and creative thinking nexus: learning experiences of doctoral students. *Studies in Higher Education*, 41(6), 971-989.
- Clarke, N. 2010. Emotional Intelligence and Its Relationship to Transformational Leadership and Key Project Manager Competences. *Project Management Journal*, 41(2), 5-20. doi:10.1002/pmj.20162.
- Coduras, A., Saiz-Alvarez, J.M., Ruiz, J. 2016. Measuring readiness for entrepreneurship: an information tool proposal. *Journal of Innovation and Knowledge*, 1(2), 99-108.
- Colbeck, C.L., Campbell, S.E., Bjorklund, S.A. 2000. Grouping in the Dark. *The Journal of Higher Education*, 71(1), 60-83. doi:10.1080/00221546.2000.11780816.
- Correia, A.P. 2020. Dealing with conflict in learning teams immersed in technology-rich environments: A mixed-methods study. *Education and Information Technologies*, 25(3), 2049-2071. <http://www.kluweronline.com/issn/1360-2357>. doi: 10.1007/s10639-019-10038-w
- Crawford, L. 2005. Senior management perceptions of project management competence. *International Journal of Project Management*, 23(10), 7-16. doi:10.1016/j.ijproman.2004.06.005.
- Daniel, A.D., Almeida, J. 2020. The role of junior enterprises in the development of students' entrepreneurial skills. *Education + Training*, 63(3), 360-376. <https://doi.org/10.1108/ET-03-2019-0049>.
- Dauth, W., Findeisen, S., Suedekum, J., Woessner, N. 2021. The adjustment of labor markets to robots. *Journal of the European Economic Association*, 1-50, doi. 10.1093/jeaa/jvab012.
- De Dreu, C.K.W., Van Vianen, A.E.M. 2001. Managing relationship conflict and the effectiveness of organizational teams. *Journal of Organizational Behavior*, 22(3), 309-328. doi:10.1002/job.71.

- E2030: Education and Skills for the 21st Century. 2017. Working paper, UNESCO 2017. <http://www.unesco.org/new/fileadmin/MULTIMEDIA/FIELD/Santiago/pdf/Habilidades-SXXI-Buenos-Aires-Eng.pdf>.
- European Commission. 2017. Communication from The Commission to The European Parliament, The Council, The European Economic and Social Committee and The Committee of The Regions on a renewed EU agenda for higher education. EUR-Lex - 52017DC0247 - EN - EUR-Lex (europa.eu).
- Friedman J.H. 1991. Multivariate Adaptive Regression Splines (with Discussion). *Annals of Statistics*. 19(1), 1-141.
- García-Aracil, A., Monteiro, S., Almeida, L.S. 2018. Students' perceptions of their preparedness for transition to work after graduation. *Active Learning in Higher Education*, 146978741879102. doi:10.1177/1469787418791026.
- Goliński, M., Miądowicz, M. 2019. Management of Employee Competencies in Resource Management of an Enterprise. In: E. Tomé, F. Cesário, R.R. Soares (Eds.), *Proceedings of the 20th European Conference on Knowledge Management*. Universidade Europeia de Lisboa, Vol. 2, Lisbon, Portugal, 5-6 September, 1132-1139.
- Goliński, M., Szafranski, M. 2019. Application of Corporate Social Responsibility for Competency Management - Case Study: Environmental Issues in Logistics and Manufacturing. In: *Corporate Social Responsibility in the Manufacturing and Services Sectors*, (eds.), P. Golińska-Dawson, M. Sychała. Springer, Cham, 3-18.
- Graczyk-Kucharska, M. 2019. Knowledge Management for Human Resources: Profile of a Generation Z Employee. In *ECKM 2019 20th European Conference on Knowledge Management*. Academic Conferences and publishing limited, 2, 434-442.
- Hack-Polay, D. 2020. Are graduates as good as they think? A discussion of overconfidence among graduates and its impact on employability. *Education + Training*, 63(3), 377-391. <https://doi.org/10.1108/ET-10-2018-0213>.
- Håkanson, C., Lindqvist, E., Vlachos, J. 2020. Firms and Skills: The Evolution of Worker Sorting. *Journal of Human Resources*, 56(2), 512-538.
- Halfhill, T.R., Nielsen, T.M. 2007. Quantifying the "Softer Side" of Management Education: An Example Using Teamwork Competencies. *Journal of Management Education*, 31(1), 64-80. doi:10.1177/1052562906287777.
- Hastie, T., Tibshirani, R., Friedman, J.H. 2001. *The Elements of Statistical Learning*. Data mining, inference, and prediction. Springer Verlag.
- James, M., Yun, D. 2018. Exploring student satisfaction and future employment intentions. *Higher Education, Skills and Work-Based Learning*, 8(2), 117-133. doi:10.1108/heswbl-03-2017-0019.
- Kolmos, A., Hadgraft, R.G., Holgaard, J.E. 2015. Response strategies for curriculum change in engineering. *International Journal of Technology and Design Education*, 26(3), 391-411. doi:10.1007/s10798-015-9319-y.
- Kopp, D., Siegenthaler, M. 2019. Short-Time Work and Unemployment in and after the Great Recession. *KOF Swiss Economic Institute, ETH Zurich*, 462, 1-65.
- Kuráth, G., Sipos, N. 2021. Competencies and success measured by net income among Hungarian HE graduates. *Education + Training*, 63(3), 417-439. doi:10.1108/et-01-2020-0015.
- Macaluso, C. 2021. High Labor Market Churn During the 2020 Recession. *Economic Brief*. Federal Reserve Bank of Richmond, 21(06). [https://www.richmondfed.org/publications/2021/eb\\_21-06](https://www.richmondfed.org/publications/2021/eb_21-06).
- Martensen, A., Grønholdt, L. 2009. Quality in higher education: linking graduates' competencies and employers' needs. *International Journal of Quality and Service Sciences*, 1(1), 67-77. doi:10.1108/17566690910945877.

- McClelland, D. 1971. *Human Motivation*, Cambridge University Press. New York- New Rochelle-Melbourne-Sydney.
- Napolitano, C.M., Hoff, K.A., Ming, C.W.J., Tu, N., Rounds, J. 2020. Great expectations: Adolescents' intentional self-regulation predicts career aspiration and expectation consistency. *Journal of Vocational Behavior*, 103423. doi:10.1016/j.jvb.2020.103423.
- Neelam, N., Bhattacharya, S., Kejriwal, V., Bhardwaj, V., Goyal, A., Saxena, A., Dhawan, D., Vaddi, A. Choudaha, G. 2018. Internship in a business school: expectation versus experience. *Higher Education, Skills and Work-Based Learning*. doi:10.1108/heswbl-03-2018-0025.
- Pagani, L., Comi, S., Origo, F. 2019. The Effect of School Rank on Personality Traits. *Journal of Human Resources*, 1218-9916R2. doi:10.3368/jhr.56.4.1218-9916r2.
- Paul, A.K., Anantharaman, R.N. 2003. Impact of people management practices on organizational performance: analysis of a causal model. *The International Journal of Human Resource Management*, 14(7), 1246-1266. doi:10.1080/0958519032000145648.
- Raine, A.L., Pandya, M. 2019. Three keys to entrepreneurial success: curiosity, creativity, and commitment. *Entrepreneurship Education*, 2(3-40), 189-198.
- Salvi, A., Vitolla, F., Giakoumelou, A., Raimo, N., Rubino, M. 2020. Intellectual capital disclosure in integrated reports: The effect on firm value. *Technological Forecasting and Social Change*, 160, 120228. doi:10.1016/j.techfore.2020.12022.
- Segerstrale, U. 2019. Education for Creativity, Skills, and Cross-disciplinary Collaboration. 2019 IEEE 18th International Conference on Cognitive Informatics & Cognitive Computing (ICCI\*CC), 1, 329-344. doi: 10.1109/ICCICC46617.2019.9146076.
- Solon, G., Haider, S.J., Wooldridge, J.M. 2015. What Are We Weighting For? *Journal of Human Resources*, 50(2), 301-316. doi:10.3368/jhr.50.2.301.
- Spychała, M., Branowska, A. 2017. Methods for improvement of entrepreneurial competencies of future managers. In: *Conference Proceedings, Engines of Urban and Regional Development, 6th Central European Conference in Regional Science, Banska Bystrica*, 694-704.
- Spychała, M., Butlewski, M. 2016. Knowledge scope and education frames of OHS specialists in Poland on example of Technical University of Lodz. *Occupational Safety and Hygiene IV*, 341-343.
- Spychała, M. 2017. Analysis of future manager's competencies - comparison of competencies levels of students at Poznan University of Technology and Lodz University of Technology. In: *Proceedings of the 16th International Conference on Business and non-profit organizations facing increased competition and growing customers' demands*, Edited by A. Nalepka, A. Ujwary-Gil, 16, 429-442.
- Szafrąński, M. 2019. Threefold Nature of Competences in Enterprise Management: A Qualitative Model, Tomé, E., Cesário, F. (Eds), *Proceedings of the 20th ECKM, Universidade Europeia de Lisboa, Lisbon, Portugal, 5-6 September*, 2, 1006-1015.
- Szafrąński, M., Erickson, G.S. 2020. HR professionals' knowledge of firms' quality requirements: An exploratory study. *Proceedings of the European Conference on Knowledge Management, ECKM, 2020, December*, 779-787.
- The European Parliament and the Council of the European Union, (2018/C 189/01). 2018. Recommendation of the European Parliament and of the Council on Key Competences for Lifelong Learning, *Official Journal of the European Union, Luxembourg*.
- The Future of education and skills. Education 2030. 2018. OECD. [https://www.oecd.org/-education/2030-project/about/documents/E2030%20Position%20Paper%20\(05.04\)](https://www.oecd.org/-education/2030-project/about/documents/E2030%20Position%20Paper%20(05.04)).
- The Future of Jobs Report. 2020. World Economic Forum. <https://www.weforum.org/reports/-the-future-of-jobs-report-2020>.
- Tordera, N., Peiró, J.M., Ayala, Y., Villajos, E., Truxillo, D. 2020. The lagged influence of organizations' human resources practices on employees' career sustainability: The moderating role of age. *Journal of Vocational Behavior*, 120, 103444. doi:10.1016/j.jvb.2020.103444.

- Urquía-Grande, E., Pérez Estébanez, R. 2020. Bridging the gaps between higher education and the business world: internships in a faculty of economics and business. *Education + Training*, 63(3), 490-509.
- Vaiman, V., Scullion, H., Collings, D. 2012. Talent management decision making. *Management Decision*, 50(5), 925-941.
- Varajão, J., Silva, H., Pejic-Bach, M. 2019. Key Competences of Information Systems Project Managers. *International Journal of Information Technology Project Management*, 10(3), 73-90. doi:10.4018/ijitpm.2019070105.
- Węziak-Białowolska, D. 2011. Operacjonalizacja i skalowanie w ilościowych badaniach społecznych. *Zeszyty naukowe Instytutu Statystyki i Demografii SGH*, nr 16.
- White Paper on the Future of Europe Reflections and scenarios for the EU27 by 2025. 2017. Register of Commission Documents, Brussels, 1.3.2017. [https://ec.europa.eu/transparency/documentsregister/detail?ref=COM\(2017\)2025&lang=en](https://ec.europa.eu/transparency/documentsregister/detail?ref=COM(2017)2025&lang=en).