

# “Changes effectiveness assessment on the basis of sustainable development factor”

## AUTHORS

Elena A. Kandrashina  <http://orcid.org/0000-0002-3689-198X>  
Anna S. Zotova  <http://orcid.org/0000-0001-5644-0249>

## ARTICLE INFO

Elena A. Kandrashina and Anna S. Zotova (2018). Changes effectiveness assessment on the basis of sustainable development factor. *Problems and Perspectives in Management*, 16(1), 437-444. doi:[10.21511/ppm.16\(1\).2018.41](https://doi.org/10.21511/ppm.16(1).2018.41)

## DOI

[http://dx.doi.org/10.21511/ppm.16\(1\).2018.41](http://dx.doi.org/10.21511/ppm.16(1).2018.41)

## RELEASED ON

Tuesday, 03 April 2018

## RECEIVED ON

Thursday, 04 January 2018

## ACCEPTED ON

Thursday, 22 March 2018

## LICENSE



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/)

## JOURNAL

"Problems and Perspectives in Management"

## ISSN PRINT

1727-7051

## ISSN ONLINE

1810-5467

## PUBLISHER

LLC "Consulting Publishing Company "Business Perspectives"

## FOUNDER

LLC "Consulting Publishing Company "Business Perspectives"



NUMBER OF REFERENCES

19



NUMBER OF FIGURES

2



NUMBER OF TABLES

0

© The author(s) 2020. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"  
Hryhorii Skovoroda lane, 10, Sumy,  
40022, Ukraine

[www.businessperspectives.org](http://www.businessperspectives.org)

**Received on:** 4<sup>th</sup> of January, 2018

**Accepted on:** 22<sup>nd</sup> of March, 2018

© Elena A. Kandrashina, Anna S.  
Zotova, 2018

Elena A. Kandrashina, Doctor of  
Economics, Professor, Samara State  
University of Economics, Russia.

Anna S. Zotova, Ph.D., Associate  
Professor, Samara State University of  
Economics, Russia.



This is an Open Access article,  
distributed under the terms of the  
[Creative Commons Attribution-Non-  
Commercial 4.0 International license](https://creativecommons.org/licenses/by-nc/4.0/),  
which permits re-use, distribution,  
and reproduction, provided the  
materials aren't used for commercial  
purposes and the original work is  
properly cited.

Elena A. Kandrashina (Russia), Anna S. Zotova (Russia)

# CHANGES EFFECTIVENESS ASSESSMENT ON THE BASIS OF SUSTAINABLE DEVELOPMENT FACTOR

## Abstract

The creation of new management methods that guarantee sustainable economic development in the long-term perspective is impossible without the overall analysis of the existing methods and system elements of enterprise management. Such analysis should take into account the influence of external and internal environment. Most of Russian organizations functioning at the market are characterized by low degree of flexibility and adaptability to the changes at the market and by traditional ways of management which do not correspond to the modern market conditions and it does not allow them to develop perfectly. The article defines the main components of the enterprise sustainable development and offers the matrix model of changes assessment on the basis of sustainable development criterion.

Thus, the general aim of the article is to form theoretical and methodical basis for management mechanism aimed at sustainable development of the enterprise, the mechanism that meets the current demands and global trends of economy development. The main methodical instrument used for the enterprise position assessment is the system of matrix coordinates. The choice of the matrix form is due to the fact that matrices are the main tool for strategic positioning of enterprises and the choice of strategic solutions in conditions of multiplicity of parameters through which the expected and actually obtained results are formalized and measured.

## Keywords

sustainable development, changes, complex economic systems

## JEL Classification

O12, Q01, P29

## INTRODUCTION

One of the key problems of economic entities in modern unstable environment is the problem of its sustainability management which should meet the following demands:

- rapid response to external influences;
- flexible and adaptive organizational structure;
- necessary resources to carry out the changes;
- the availability of an information base and modern means of processing it for the timely identification of change critical factors.

Consequently, formation and realization of sustainable development potential requires implementation of business process transformation and special management for complex economic systems (CES) in order to improve their ability to perform effectively.

The environment of CES functioning is dynamic, which is characterized by its constant susceptibility to changes. The implementation of a policy of sustainable development requires economic subjects to know about the changes that are taking place, their readiness for them and

their ability to respond promptly to the impact of destructive influence. So, there is an urgent need to manage the factors affecting its sustainable development, including a set of measures aimed at regulating all subsystems of the enterprise, supporting the appropriate response of the system to external disturbances and creating conditions for realizing transformations that ensure sustainable development. The degree of sustainability in CES development is determined by the interaction of both external and internal factors, which have positive and negative impact on it. External factors act as the creators of conditions for realizing the potential of sustainable development, and internal factors are responsible for the formation of this potential.

Thus, the basis for the factors management approach should be a system of prior and subsequent assessment of management decisions quality, connected with implementation of changes from the perspective of their contribution to formation and realization of sustainable development potential.

Moreover, change management processes are increasingly demanding in terms of reducing time to plan and implement change. At the same time, one cannot ignore the fact that the implementation of changes is a special type of innovative and investment projects that require significant resources, both financial and organizational, and involve significant risks. In this regard, the implementation of changes should be proved as the essential one.

---

## 1. LITERATURE REVIEW

The concept of sustainable economic development was laid in 1987 by Barbier (1987). He showed that the aims of preservation of the environment and economic development do not contradict each other. A decade later, the idea of sustainable development began to belong to business development (Ghemawat, 1999). Dyllick and Hockerts (2002) found out that business case alone will not be sufficient to achieve sustainable development. That is why they defined 4 criteria that a firm has to satisfy if it wants to develop sustainably: eco-efficiency, socio-efficiency, sufficiency, and eco-equality. The problem of sustainable development related to various spheres and branches of economy is still being studied in the works of Anthonamma and Kavitha (2012), Badea, Badea, and Raboj (2016), Borza, Brezuleanu, and Alexandru-Drăgos (2016), Zhang (2016), Yu Zhigang (2015) and Li (2013).

Ensuring sustainable development of complex economic systems by means of timely and necessary organizational changes is the most common result of change management (Sidorova, 2015).

Major part of the research on the notion of management effectiveness deals with unifying theories, which cover an organization as a whole, and private theories, which consider effectiveness in relation to specific aspects of management prac-

tice, such as human potential management, control levels or leadership. The theoretical basis of economic evaluation of efficiency was laid in the works of such scientists as Norton and Kaplan (2008), Brealey and Myers (2003).

The process of change management is rather complex and its fragmentary study, from the point of methods or main approaches such as mainly staff resistance assessment (Proctor, Doukakis, 2003; Price & Chahal, 2006; Oakland & Tanner, 2007), does not allow to take into account system dynamics and synergy factors. This stipulated the objective need for concept approach to change management strategy in the organization.

## 2. METHODS

General scientific methods of research, methods of system analysis, scientific abstraction and generalization, comparative and categorical analysis were used while analyzing the influence of external and internal factors. The second part of the research work was done with the help of empirical description, expert assessments, and concrete scientific methodological approaches to the theory of management and decision-making.

Following on from the theory of evolution, complex economic systems development is evaluated

as implementation of changes, aimed at increasing orderliness in the system, its modernization and increasing complexity; and not through the lens of the system destruction.

When justifying management decisions, related to changes implementation, most of the researchers find it reasonable to compile a traditional approach to their effectiveness assessment, based on financial indicators, with an approach based on a qualitative performance evaluation (Brandenburg, Govindan, & Sarkis, 2014; Bluszcz & Kijewska, 2016; Che, 2016). Consequently, it is reasonable to use the notions of effect and efficiency as having more general nature and based not only on quantitative, but also on qualitative indicators.

To formalize the process of justifying the choice of an administrative decision on enterprise sustainable development, it is offered to use an approach, based on assessment of an enterprise position in the system of matrix coordinates.

### 3. RESULTS

Most of modern scientific approaches are based on the three-factor definition of sustainable development including social, ecological and economic aspects. Today the understanding of sustainability essence requires taking into account some additional factors. It was stipulated by the transformations happened in social and economic formation of the world and considerable influence of global processes around the world on sustainable development of separate economic entities (Stoian & Nica, 2016). The authors' approach is based on the supposition that the common point of view should be supplemented with one more constituent and that is global process. The development of modern civilization can be the substantiation of such position. Changes that might happen in one separate country including those that do not have strong influence on the world market finally lead to the global transformation in the whole world. There is direct dependence between the influence of various social and economic factors on the global system and its reverse influence on every sphere of separate state functioning.

It is proved by the authors that sustainable development is based on the combination of econom-

ic development (economic effect) with ecological safety (that is action directed at lowering harmful influence on the environment), social development (having the effect for society) and global evolutionism (interaction of systems of various levels). That is why in further research the authors take economic, social, ecological and global sustainability as a basis. These types of sustainability have significant importance in the question of giving characteristics of sustainable development of separate social and economic systems including the level of organizations.

The basis of classical understanding of the effectiveness of economic activity is a comparison of the effect (result) of activity with advanced resources or current costs, associated with achieving this effect. Under this approach, either production issues or profits (from realization of products or from ordinary activity) are considered as indicators of the effect. Indicators of the volume of advanced resources are basic, circulating or aggregate productive assets in value terms, and indicators of current expenditures are labor outlays (in terms of working time or number of employees), labor input – facilities (depreciation of basic production assets) and subjects of labor (raw materials, materials, fuel and energy) also in value terms. Efficiency of advanced resources usage is reflected in indicators of specific resources output: capital productivity, material output, labor productivity, the system of profitability indexes.

Another approach to efficiency determination is comparison of the actually received result in the activity being evaluated to the planned result. This method is preferred for making managerial decisions.

There are external and internal sources of change, as well as external and internal effects of their functioning in economic systems. Correspondingly, it is reasonable to distinguish internal and external CES performance in general and conduct their organizational transformations in particular.

The system of factors which determine the direction and efficiency of forming the sustainable development program of the organization were grouped into two big subsystems.

**The first group – coordination factors:**

- the factors of coordination of sustainable development program with the complex development strategy of the organization. The group includes such factors as factors of effective achievement of sustainable development aims; factors of coordination of methods and instruments of management mechanism with forecasted transformation of external environment; the factors of threats of sustainable development.

**The factors of changes in segment structure of the market, etc.:**

- the factors of coordination of sustainable development program with internal factors of the organization including the development potential of the organization with its constituents such as finance, organization, information, staff and other types of potential;
- the factors of inner coordination of sustainable development program which suppose the balance between the definite aims of the program and targeted indicators of sustainable development, and also the balance in time of using the methods and instruments of achieving the aims set in the program.

**The second group – realization factors:**

- efficiency factors of sustainable development program realization allow to determine the possibility of transformation of organization resources to achieve sustainable development aims, and also the possibility to attract extra volumes of material and non-material resources from all potential sources taking into account the technology and economic instruments;
- the factors of possible risks while implementing the sustainable development program give idea about the degree of possibility to forecast the risks in the activity of certain organization and their possible level from the point of view of extra costs appearance in order to prevent the bankruptcy of the organization;

- the factors of effectiveness from the point of aims achievement while implementing the sustainable development program. These factors are based on the tasks of organization development united by the common aim.

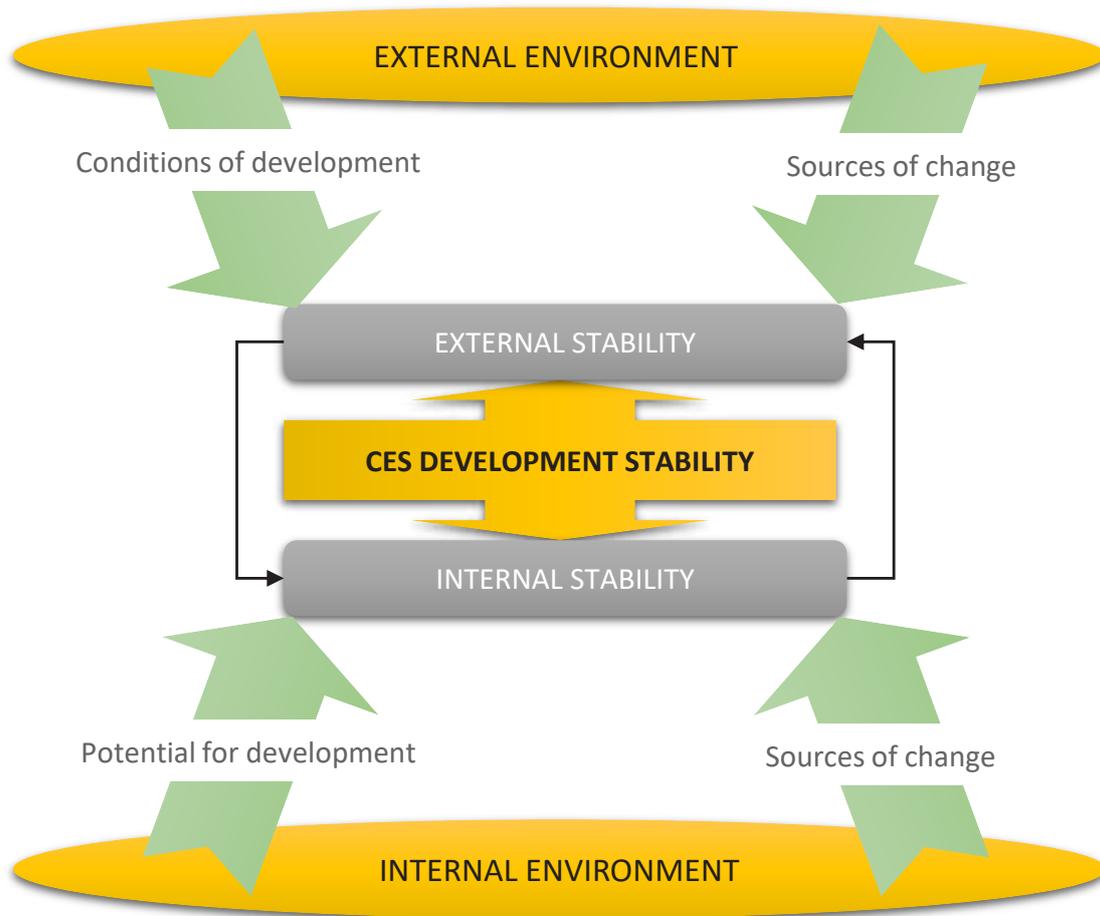
One of the results of the study is the presented justification of the fact that interaction of the elements of the institutional environments for CES functioning – global, state, regional, and also the elements of the economic development potential of the CES itself – should be considered as a mechanism providing “the possibility of change maintenance”. Accordingly, while analyzing CES development stability, its external and internal stability should be identified as a result of the changes being carried out.

The external stability is defined as a coordinated interaction with external factors, influencing on the work of CES. Among such is a political environment, an ecological environment, a social status in society, an economic situation, the work of suppliers, competitive struggle in the market, tax policy, investment activity, etc. The internal stability can be characterized as a harmonious interaction of all CES subsystems, which makes it possible to achieve economic results, acceptable from the point of view of all contact audiences.

As a result of interaction of external and internal stability, the overall stability of CES development is formed (see Figure 1).

Thus, the degree of CES development sustainability depends on the cumulative impact of external and internal factors, exerting both positive and negative influence on it. The internal factors determine the potential – capacity of CES to sustainable development, and the external factors characterize conditions for realization of this potential. At the same time, neither external nor internal environment are frozen systems – events, taking place in them, serve as sources of changes that transform the conditions of CES functioning and, as a result, force it to adapt (in case of reactive approach to management) or to outrunning changes (in case of proactive approach).

Following the logic of change management, the interaction of external and internal environment of



**Figure 1.** Components of CES development stability

CES functioning should be considered in dynamics. In this regard, effective organizational changes are those which contribute to a positive change in the criteria indicators, identified as the result of conducted changes.

The most common result is ensuring the sustainability of CES development in a changing operational environment. Moreover, the sources of change occur both in external and internal environment. Accordingly, there is a need in analyzing the changes in external and internal stability of CES development as a result of the conducted changes and their synthesis for revealing the integrated effectiveness.

To compare the obtained performance characteristics, their convolution is possible in the matrix field. Moreover, each of the selected characteristics has correspondence to each of the four axes, and the axes themselves represent an ordinal (or rank)

scale, in which the order of elements in terms of the level of manifestation of a certain property is significant, and the quantitative expression of the difference is insignificant or poorly achievable. This is observed in the reviewed situation of assessing the effectiveness of organizational changes.

The gradation of each axis into 4 emphasized states allows the initial matrix field to be divided into 16 quadrants, while the matrix field is divided into 4 sectors, and 4 quadrants correspond to each of them.

For positioning CES in the matrix field, it is necessary to choose the actual variable values, corresponding to the matrix parameters, on each of 4 axes and to draw the lines, connecting parallel axes of the matrix through points – the centers of the corresponding intervals of each of the axes. The point of their intersection will determine the position of the analyzed CES in the matrix field (Figure 2).

		CES response speed					
		Increase in awareness and understanding	Increase in external flexibility	Increase in internal flexibility	Forthright reaction		
Change in the level of CES development	Economically viable expansion	<b>S1</b>	<b>S2</b>	<b>U1</b>	<b>U2</b>	Comfort environment	Level of environmental comfort of CES functioning
	Economically non-viable expansion	<b>S3</b>	<b>S4</b>	<b>U3</b>	<b>U4</b>	Neutral environment	
	Reduction of development potential	<b>P1</b>	<b>P2</b>	<b>C1</b>	<b>C2</b>	Aggressive environment	
	Loss of development potential	<b>P3</b>	<b>P4</b>	<b>C3</b>	<b>C4</b>	Catastrophe level of environmental comfort	
		Balanced structure	Growth-oriented structure	Stable structure	Structure leading to degradation		
Equilibrium of CES structure							

**Figure 2.** Matrix of CES organizational changes effectiveness

The division of the subspace into sectors is based on a qualitative transition of CES (while implementing organizational changes) from one state, determining the trends of further development, to another.

The obtained sectors can be characterized as follows.

The upper left corner of the matrix corresponds to sustainable development. The conducted organizational changes should be recognized as highly effective. The current state of CES is characterized by both external and internal development stability, an economic entity responds quickly and adequately to the emerging sources of change. High innovative activity and the response speed of the management system of the economic entity to the emerging information signals ensure its effective development at any level of environmental comfort.

The upper right corner of the matrix corresponds to unsustainable development. On the one hand, the growth of development potential and/or environmental comfort, including through increase in competitiveness because of organizational changes, is accompanied by insufficient flexibility of the control system that is unable to provide high

speed of CES response to emerging sources of change, and the CES structure, due to inadequate innovative activity.

The lower left corner of the matrix corresponds to problematic development. Despite positive changes in the CES structure and increase in its administrative flexibility, negative changes in the development potential, in conditions of not very comfortable working environment, do not allow assessing the conducted organizational changes unequivocally positively. In such circumstances, the management should carefully reconsider the CES development strategy for compliance of resource potential with market opportunities.

The lower right corner of the matrix corresponds to the crisis. Even the ongoing organizational changes are practically unsuccessful. This means that CES does not receive an impetus to enter the path of sustainable development. In conditions of low comfort of the external environment, CES does not possess either development potential, or significant competitive strengths. It means that it does not have an opportunity to carry out radical organizational changes except for those, which are related to business restructuring and elimination of the weakest parts in order to mobilize the re-

maintaining resources for creation new growth points due to loss of a part of inefficiently used resources. However, such decisions are extremely difficult, especially in the context of requirements of regional and local authorities to employment preservation and access to government support programs. This is typical of the current economic situation.

Possible vectors of CES development through implementation of organizational changes are usually associated with improvement or stabilization of the existing position. This provides movement to the more favorable part of the matrix field, respectively, to the right and up.

The division of each sector into 4 segments is based on differences in a position of an economic

entity within the same state. It allows to formulate specific vectors of CES development by increasing the effectiveness of the conducted organizational changes for each quadrant of the matrix.

## 4. DISCUSSION

The offered methodological approach of CES positioning in the matrix field of organizational changes effectiveness makes it possible to systematize the factors, determining its capacity to sustainable development, and use the obtained conclusions in elaboration of alternative management decisions in order to ensure their focus on increasing development sustainability in external environment of varying degrees of comfort.

---

## CONCLUSION

Therefore, the offered methodological tooling for diagnosis and justification of managerial decisions on implementation of organizational changes makes it possible to increase reasonableness and tendency of their conducting, reduce financial risks and cause the growth of the final project effectiveness.

The article is dedicated to the following results of the research work:

- the degree of CES development sustainability depends on the cumulative impact of external and internal factors. Internal factors determine the potential – capacity of CES to sustainable development, and the external factors characterize conditions for realization of this potential;
- following the logic of change management, the interaction of external and internal environment of CES functioning should be considered in dynamics. In this regard, effective organizational changes are those, which contribute to a positive change in the criteria indicators, identified as the result of conducted changes;
- the following parameters were singled out as criteria indicators of organizational changes effectiveness, reflecting shifts in internal stability of complex economic systems development: changing the level of CES development potential, resulting from improvement of its economy, and changing the speed of response, which is a managerial result of organizational changes;
- the following parameters were distinguished as criteria indicators of organizational changes effectiveness, reflecting shifts in the external stability of CES development: shift in the comfort level of CES operational environment, due to change in its competitiveness; equilibrium of sources for economic added value creation in the CES structure.

The indicated approaches to management can be considered as reference ones. In order to manage sustainable development of a particular object, a response system, appropriate for its ability and willingness to adapt to changing environmental conditions, must be formed.

## ACKNOWLEDGEMENT

The research is done in the frame of the state task of the Ministry of Education and Science of the Russian Federation No 26.9402017/PC “Change management in high education system on the basis of sustainable development and interest agreement”.

## REFERENCES

1. Anthonamma, K., & Kavitha, N. V. (2012). Change management in higher education institutions sustainable development. *6th International Conference of Technology, Education and Development (INTED)* (pp. 5141-5147). Book series: INTED Proceedings. Valencia: SPAIN.
2. Badea, G., Badea, Ana-Cornelia, & Raboj, D. (2016). A new functional master specialization on GIS and sustainable development at faculty of geodesy. *16th International Multidisciplinary Scientific Geoconference, Bucharest*. Albena: BULGARIA.
3. Barbier, E. (1987). The Concept of Sustainable Economic Development. *Environmental Conservation*, 14(2), 101-110. <https://doi.org/10.1017/S0376892900011449>
4. Bluszcz, A., & Kijewska, A. (2016). Selected global indicators for the assessment of sustainable development. *16th International Multidisciplinary Scientific Geoconference* (pp. 523-530). Albena: BULGARIA.
5. Borza, M., Brezuleanu, S., Robu, & Alexandru-Drăgăș (2016). The sustainable development: conceptual and implementing barriers in East-European countries. *16th International Multidisciplinary Scientific Geoconference*. Albena: BULGARIA.
6. Brandenburg, M., Govindan, K., & Sarkis, J. (2014). Quantitative models for sustainable supply chain management: Developments and directions. *European journal of operational research*, 233(2), 299-312. Retrieved from [https://www.researchgate.net/publication/256839508\\_Quantitative\\_models\\_for\\_sustainable\\_supply\\_chain\\_management\\_Developments\\_and\\_directions](https://www.researchgate.net/publication/256839508_Quantitative_models_for_sustainable_supply_chain_management_Developments_and_directions)
7. Brealey, Richard A., & Myers Stewart C. (2003). *Principles of Corporate Finance* (7th ed.). McGraw-Hill.
8. Che, QuanHui (2016). The evaluation of sustainable development. *3rd International Conference on Education, Management and Computing Technology (ICEMCT) Hangzhou, PEOPLES R CHINA*, 59, 1058-1060. Book series: Advances in Social Science Education and Humanities Research.
9. Dyllick, T., & Hockerts, K. (2002). Beyond the business case for corporate sustainability. *Business Strategy and the Environment*, 11(2), 130-141. <https://doi.org/10.1002/bse.323>
10. Ghemawat, P. (1999). *Strategy and the Business Landscape*. Addison-Wesley.
11. Kaplan, Robert S., & Norton, D. P. (2008). *The Execution Premium: Linking Strategy to Operations*. Boston, MA.: Harvard Business School Press.
12. Li, Fei (2013). Sustainable Development of Medium-Sized High-Tech Industrial Clusters. *4th International Conference on Education and Sports Education. Hong Kong, PEOPLES R CHINA*, 12, 46-51.
13. Oakland, J. S., Tanner, S. (2007) Successful change management. *Total Quality Management and Business Excellence*, 18(1-2), 1-19. Retrieved from <https://ru.scribd.com/document/356637712/Oakland-Successful-Change-Management-pdf>
14. Proctor, T., Doukakis, I. (2003). Change management: the role of internal communication and employee development. *Corporate Communications: An International Journal*, 8(4), 268-277. <https://doi.org/10.1108/13563280310506430>
15. Price, A. D. F., Chahal, K. (2006). A strategic framework for change management. *Construction Management and Economics*, 24(3), 237-251. Retrieved from <http://www.ingentaconnect.com/content/routledge/rcme/2006/00000024/00000003/art00005>
16. Sidorova, L. (2015). Social responsibility and organizational management at the university of Carabobo: short-term changes in sync inescapable. *Dialogica*, 12(1), 209-234.
17. Stoian, M., & Nica, Ana-Maria (2016). Eco-innovation between sustainable development and economic performance. *16th International Multidisciplinary Scientific Geoconference*. Albena: BULGARIA.
18. Yu, Zhigang, & Chen, Rongrong (2015). Educational Sustainable Development: The New Research Topic of National Demonstration Higher Vocational Education. *3rd International Conference on Management, Education, Information and Control, Shenyang, PEOPLES R CHINA*, 125, 1172-1175.
19. Zhang, L. (2016). The secret of sustainable development. *3rd International Conference on Education, Management and Computing Technology (ICEMCT), Hangzhou, PEOPLES R CHINA*, 59, 1046-1049. Book series: Advances in Social Science Education and Humanities Research.