

26th INTERNATIONAL CONFERENCE ON
PRINTING, DESIGN AND GRAPHIC COMMUNICATIONS

BLAŽ BAROMIĆ 2022

26. MEĐUNARODNA KONFERENCIJA
TISKARSTVA, DIZAJNA I GRAFIČKIH KOMUNIKACIJA

ZBORNIK RADOVA *PROCEEDINGS*

Zagreb, 15. - 16. prosinca 2022., Hrvatska
Zagreb, 15th - 16th December 2022, Croatia

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PREDGOVOR

26. međunarodna konferencija PDC održana je na Sveučilištu u Zagrebu Grafičkom fakultetu, 15. i 16. prosinca 2022. Ovogodišnja Konferencija usmjerena je na predstavljanje najnovijih kvalitetnih rezultata istraživanja znanstvenika iz Europe, podršku razvoju mladih znanstvenika sudjelovanjem u doktorskoj školi, prezentaciji rezultata projekta te izlaganju umjetničkih fotografskih radova studenta prijediplomskog i diplomskog studija. Cilj konferencije je osiguranje i stvaranje potrebnog okruženja za poticanje rasprave, razmjene mišljenja i umrežavanje među europskim istraživačima iz akademske zajednice i industrije. Svi radovi objavljeni u ovom zborniku recenzirali su stručnjaci u obliku slijepe recenzije, te revidirani od strane autora radi poboljšanja prema uputama i savjetima recenzenata.

Zahvaljujemo programskom i recenzentskom te organizacijskom odboru, voditeljima sekcija, studentima suradnicima i administrativnim djelatnicima, za doprinos uspjehu ove Konferencije.

Na kraju, želimo zahvaliti svim autorima koji su prijavili sažetke i omogućili ovu konferenciju. Zahvaljujemo se na kvaliteti njihovih prezentacija i komunikaciji s ostalim sudionicima.

26. Međunarodna konferencija tiskarstva,
dizajna i grafičkih komunikacija

FOREWORD

The 26th PDC International Conference was held at the University of Zagreb, Faculty of Graphics, on December 15 -16, 2022. This year's conference is aimed at presenting the latest high-quality research results of scientists from Europe, supporting the development of young scientists by participating in doctoral school, presenting project results, and exposition the artistic photographic works of undergraduate and graduate students. The aim of the conference is to provide and create the necessary setting for stimulating discussion, exchange of ideas, and networking among European researchers from academia and industry. All papers published in this collection were reviewed by experts in the form of a blind review and revised by the authors for improvement according to the instructions and advice of the reviewers.

We would like to thank the Program and review and Organizational board, heads of sections, associates students, and administrative staff, for their contribution to the success of this Conference. Finally, we would like to thank all authors who submitted abstracts and made this conference possible. We are grateful for the quality of their presentations and communication with other participants.

26th International Conference on
Printing, Design and Graphic Communication

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PRETHODNO PRIOPĆENJE

**PREVIOUS
COMMUNICATION**

radic

**OPERATIVNA IZVRSNOST U FUNKCIJI UNAPRJEĐENJE SUSTAVA
OSIGURAVANJA KVALITETE VISOKOG UČILIŠTA
OPERATIONAL EXCELLENCE IN THE FUNCTION OF ENHANCING THE
QUALITY ASSURANCE SYSTEM OF HIGHER EDUCATION**

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Sažetak

Visoko učilište mogu ocijeniti izvrsnim samo njegovi unutarnji i vanjski dionici. Spoznaja izvrsnosti je odnos prema znanstveno-istraživačkom, umjetničkom te stručnom radu koji visoko učilište integrira u gospodarstvo i čini ga inkluzivnim u kontekstu stvaranja novih društvenih normi za potrebe jačanja socijalne kohezije. Stoga se njegova operativna izvrsnost može prezentirati kroz pozitivno pridavanje značenja organizacijskih obilježja kao što su ljudski resursi, politika poslovanja i mapiranje procesa kojima se unaprjeđuju performanse djelatnosti visokog učilišta. Spoznaja izvrsnosti proizlazi iz odgovarajuće razine kvalitete, a izvrsnost samo jednoga zaposlenika nikada nije jamac kvalitete institucije. Meta kognitivne vještine kod zaposlenika mogu ispuniti potrebe gospodarstva i zajednice, za razliku od politika koje su samo standardizirane interne pravne odluke podložne mijenjanju, revidiranju i ukidanju. Kompetencije zaposlenika i njihova predanost ciljevima dvije su komponente operativne izvrsnosti. Treća i najvažnija komponenta je stvaranje poticajnog radnog okruženja od strane tijela upravljanja. Poticanje samoučenja kroz razmjenu znanja i iskustva među kolegama održava razinu njihovih kompetencija. Ako predanost radu nije prepoznata do samoučenja neće niti doći. Stoga se operativna izvrsnost unaprjeđuje po modelu motivacije pojedinca i to na radnom mjestu.

Ključne riječi: *operativna izvrsnost, unaprjeđenje osiguravanja kvalitete, mapiranje procesa.*

Abstract

Excellence of higher education institution (HEI) can only be evaluated by its internal and external stakeholders. Knowledge of excellence is attitude toward scientific research, artistic and professional work that integrates HEI with the economy and embeds it in a creative context of new social norms such as the need to strengthen social cohesion. So, its operational excellence can be represented by positive meanings attached to organizational characteristics as human resources, business policies, and process mapping tools that enhance performance activities. Excellent knowledge implies acceptable level of quality, and excellence of individual employee is never guarantee of HEI's quality. The metacognitive skills of employees can improve economy and community needs, unlike policies that are just standardized internal legal decisions that can be changed, revised, and repealed. Employees' competencies and purposefulness are two attributes of operational excellence. The third, and most important attribute is creation of stimulating work environment by HEI leaders. Encouraging self-directed learning by sharing knowledge and experiences through communication among colleagues maintains high levels of employee competencies. If commitment to work isn't recognized, self-directed learning won't occur. Increasing operational excellence results from modelling a well-being work environment.

Keywords: *operational excellence, enhancing quality assurance, process mapping tools.*

1. INTRODUCTION

Both in business systems and higher education systems, it is necessary to define organizational characteristics that contribute to operational excellence. Only through a high level of operational excellence can the quality of HEI be assured. Operational excellence is extremely important for implementing the defined strategy and achieving the goals by identifying, initiating and implementing the necessary changes and improvements in the management system. Operational excellence can be presented by assigning positive importance to organizational characteristics such as human resources, business policies, and business process mapping that improve HEI's performance. Operational excellence is a prerequisite for business efficiency.

Human resources represent the workforce of the organization. A narrower concept is human capital, which is the knowledge and skills that individuals possess [1]. There are numerous activities within human resource management, the most important of which are: recruitment (planning and selection), development and training, and the evaluation and progression system. It also includes activities such as monitoring various aspects of employment, such as compliance with labour laws and employment standards, performance management, managing employee benefits, organizing employee files with required documents for future reference, and some aspects of recruiting (also known as talent acquisition) and offboarding employees. They serve as a link between an organization's management and its employees. Coordination of employee relations activities and programs, including employee counselling, should not be neglected [2, 3].

In addition to human resource management, it is extremely important to define business policies and procedures as well as systems, processes, and management practices as organizations become more or less formalized. Business policies are influenced by external and internal factors. External factors are primarily the socioeconomic characteristics of the business environment, while internal factors are the nature and size of the organization, human and material resources, and other constituent elements. Business policy determines the planning, implementation, control and audit of all business processes in the organization, with particular emphasis on quality policy, as it clearly determines the development of the organization and all employees [4].

Since the business policy contains detailed descriptions of all processes, business process mapping techniques are used to visualize the purpose and operation of a particular business process. Business process mapping is actually defining what a business process does, who is responsible for the output standards, as well as the necessary techniques and tools are required to implement it. And finally, determining the success of that business process [5]. The main reason for business process mapping is to increase the efficiency and quality of the business. The purpose of business process mapping is to provide a clear diagram or detailed visual representation of the business process to easily identify where improvements can be made to the business process to increase efficiency and quality. It is also a way to quantify a specific goal so that it can be compared and aligned with the overall goals of the business. Business process mapping is done in five phases, namely: design, modelling, implementation, monitoring and optimization. It is actually a continuous cyclical process designed to improve the business process and the quality of the results.

Without the synchronous and synergistic interaction of the trefoil, which consists of human resources, business policies and business process mapping, good quality management is not possible for any organization, including HEIs.

2. MODERNIZATION OF EMPLOYEE MANAGEMENT AT HEI

Higher education institutions (HEIs) in Croatia are key partners in the implementation of European strategies (Europe 2020 and Effective Human Resources) for the progress and maintenance of economic growth [6]. Modernization of HEI is expected to increase the employability of graduated students through their active and effective scientific, professional, and social engagement. Therefore, the management of human resources in higher education requires

the professionalization of scientific-teaching and administrative staff. Therefore, it is only possible to achieve strategic goals by evaluating personnel through their career development. Due to the high level of autonomy at HEI (influential unions, collective agreement, unique status of professors), staff development and management are limited because there are no standardized tools for measuring the work performance and competence of employees [7]. Therefore, employees are not focused on achieving strategic goals of HEI, they do not achieve the expected results because they do not have the necessary competencies, which are a criterion for success. "Putting the right people in the right place" means recognizing the employee's metacognitive skills acquired during the formal education process [8]. Such "personal life skills" are primarily focused and aligned with the impact of knowledge, skills, attitudes, and various attributes on a specific problem. When competence is expressed through personal independence and commitment to work. Unfortunately, the metacognitive skills of employees are not evenly represented at different workplaces in the organizational structure of HEI. For this reason, it is not even possible to achieve the expected strategic results. The criterion for success is competent employees who think about and control their own thinking processes without popularizing that even insufficient quality is actually effective. The measurement of work performance through employee competency development must be strictly defined and standardized to achieve work-life balance. The strategic goals of HEI can only be achieved through the professional development of an individual, who participates in a long-term professional development process, because employees are able to freely apply new knowledge and skills in daily practice. Conversely, in a rigid organizational structure, leaders are perceived as overseers of compliance with laws and regulations. This type of structure should be strictly avoided, and the newly created professional management bodies (deans, vice-deans, leaders) should take on the role of advisors/facilitators. If they personally provide positive and constructive guidance to employees on how to improve their work. Leaders should avoid methods of control and coercion to improve work performance. Dialog between leaders and employees should be an active, ongoing process, continuous process, in which clear and two-way communication is expected. The information system for the purposes of transmitting relevant information should be used to a sufficient extent. The use of information systems makes strategic decisions easier, and more transparent, and potentially improves the efficiency of the work of HEI's employees. The scientific and teaching staff now no longer focuses exclusively on its teaching and research activities, but HEI is successfully expanding its services to the business community and integrating them into the broader social community thanks to the quality of the work of the governing bodies and administrative staff.

3. QUALITY ASSURANCE PRINCIPLE AS THE FACILITATOR TOWARDS ECONOMY AND COMMUNITY

European society tends to become knowledge-based, hence HEI has an essential role of socio-economic and cultural development. The increasing demand for skills and competences have to come from HEI and must be representative of the economy and community. The achieved qualifications and competences of HEI need to meet the global economic policy requirements that create the conditions for balances and sustainable economic growth. Therefore, the role of quality assurance is circular in supporting HEI system and their institutions in European area [9]. European standards and guidelines for quality assurance in HEIs ensure to increasing transparency of international learning and teaching processes among all stakeholders. Also, it helps to build mutual trust among interest groups on a global level. The ESG 2015 document consists of a set of standards and guidelines. They are important for a successful support in the learning environment, and they are relevant links for research and innovation through enhancing cycles. Only competent students and teachers are able to meet the expectations of global stakeholders and society, hence HEI's internal quality assurance must be the starting point for upcoming strategic goals realization. Ensuring the quality of internal work undertaken by HEI is directly relevant for its external quality assurance. Therefore, ESG 2015 guidelines must be implemented in the internal workflow, internal stakeholders (teachers, researchers, students, and administrative staff) need to set out good practices in relevant areas and they need to considerate

them in various legislative bodies of HEI. Committee members need to find efficient solutions that lead to strategic goals achievements and self-assessment other HEIs which are similar to them. Therefore, various strategic management tools (benchmarking, SWOT, PESTLE trends, etc.) need to be implemented in the work, but internal stakeholders do not have specific knowledge and practical skills to use these tools in daily practice, in their workplaces. So, HEI leaders need to ensure transparent collecting and relevant data base analyzing. The involvement of external stakeholder in the work of HEI can begin start after more effective managing of leaders who contribute to collaborative teamwork. Unfortunately, without professional development, it is difficult to enhancing HEI's quality system. If employees do not have practical skills, they will not be able to adapt advanced global trends. The main rule is that everyone (leaderships, teachers, researchers, staff, Alumni, students) need to be engaged on various way into internal quality assurance system. Moreover, participants need to be intolerance of any kind of discrimination, the obligatory each person to respect the academy integrity and freedom. This is the first step towards the integrity internal and external stakeholders in the quality assurance system. Only when the leaders of HEI are conscious of weaknesses, they can recognize themselves strengths and together with their partners (entrepreneurs and the community) discover possible ways to enhancing internal teamwork environment. Thus, the Committee of quality assurance system is responsible to perform activities and procedures for enhancing institution work quality (Figure 1). Participants tend to exchange knowledge, practical experiences, and good practices. They together need to encourage networking through expand their circles of acquaintances. Unfortunately, Croatian HEI's participants testify a lack of training events about learning how become well manager [10] hence, they must continue with current practices. Participants need to be able to analyze and interpret the collected information in order to enhance quality system and promote self-evaluation culture in same time. This is difficult path because participants continuously need to collect relevant facts, by means questionnaires, from internal and external stakeholders. The information needs to be processed, analyzed, and discussed at Committee meetings, but in most cases, these procedures are not recognized by HEI leaders.

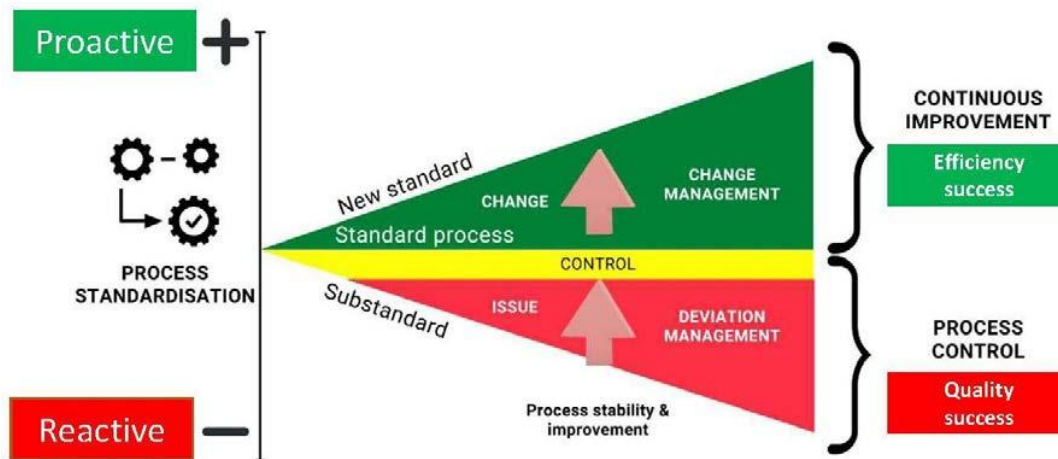


Figure 1: General principle for enhancing internal HEI's inclusive teamwork environment

Source: International Standard for Lean Six Sigma [11]

As mentioned earlier, without discussion there is no progress and recognition of good practices. Internal quality assurance should come through networking and practical experiences that are particularly useful for other participants who are involved in achieving of HEI strategic goals (Figure 2). Therefore, internal stakeholders need to express interest in more internal workshops, and they need to suggest concrete topics that would attract the attention of others. Employees are the most valuable resources of HEI integrity.

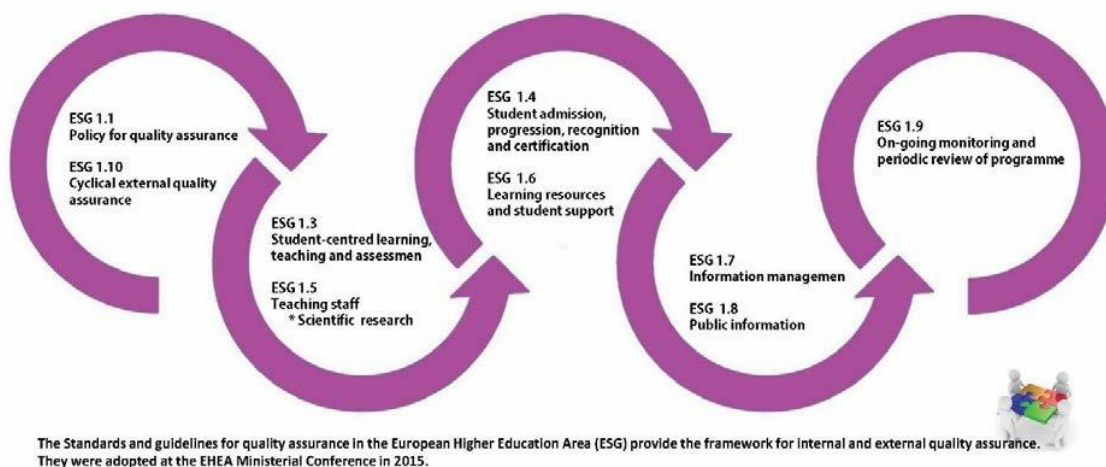


Figure 2: Collaborative teamwork including into internal HEI quality assurance system

Source: own

It is important to note that continuous learning, encouraging, and developing of individual metacognitive skills that are responsible for the quality of teamwork. In this way, the HEI employees become aware their contributing to an efficient goal realization. The employee motivations rise with the exchange of knowledge and information among HEI's departments and committees (Figure 3). In such teamwork environment, the employees are willing to commit themselves to the work and institution and starting to present their ideas and suggestions to the HEI leaders.

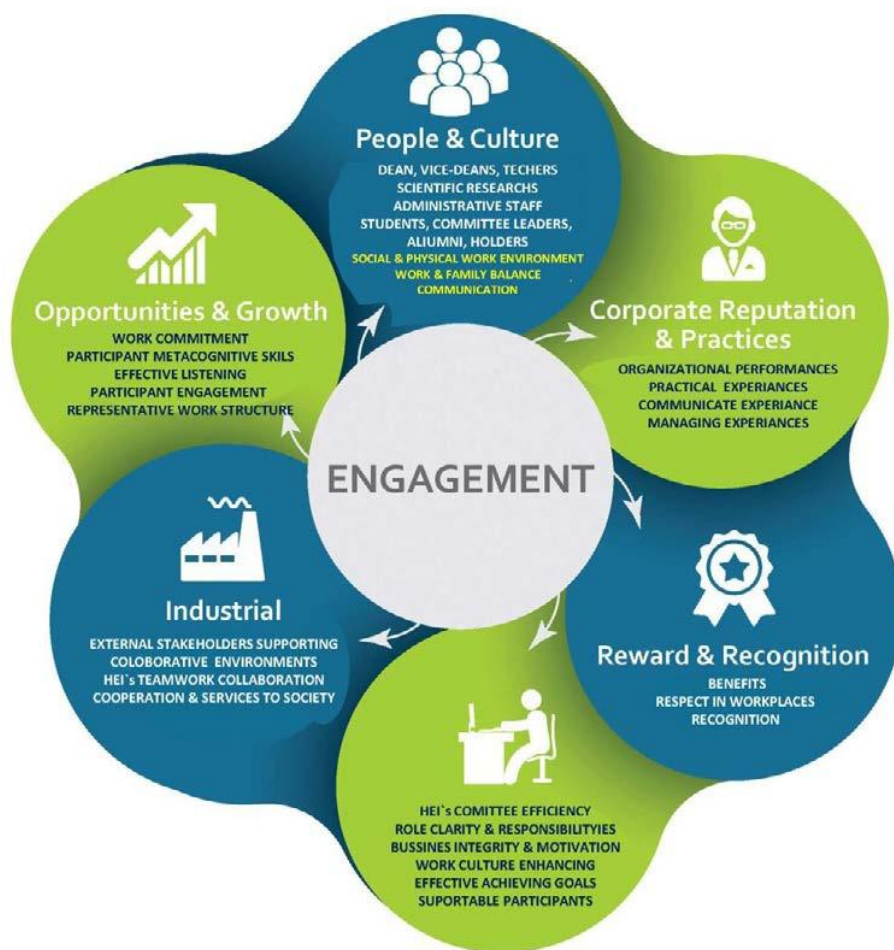


Figure 3: Principles of effective participant engagements towards goals realization

Source: The Right Group [12]

4. GOOD PRACTICES TO ENHANCING WORK COMMITMENT TO HEI

Professional commitment means an employee's adherence to work ethic, who is commitment to a career, job involvement and organizational commitment, too. It is the most important factor. First the HEI's leaders must learn to be commitment to the institution and to respect and value the opinions and competences of their employees. So, a good leader of HEI knows how to communicate, discuss, and develop social attitudes after successes or failures. The socially sophisticated wise leader knows how to play game of social interaction. This is result of person effective listening, behaving, managing, and controlling skills. That leader is superior because of his brilliance in carry out activities and organization functioning. A leader knows how to achieve operational excellence following key elements such as work commitment, passion to encouraging employees to work devotion, strictness in judgement someone/something and discipline that is built on loyalty. One of the main benefits of operational excellence is the collaborative team environment at HEI, in which HEI members together to improve the institution's processes and effectiveness as result of employee engagement. This is the right way to enhancing quality culture of the institution (Figure 4).

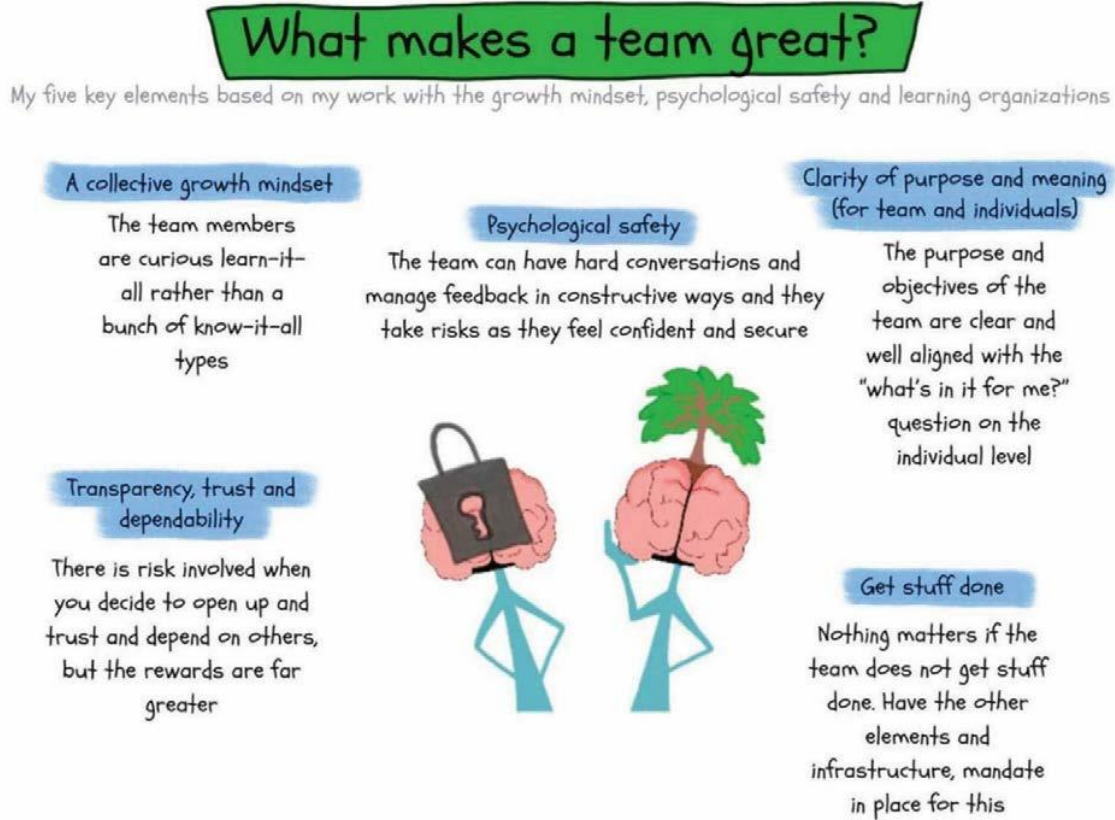


Figure 4: Principles of effective participant engagements towards goals realization

Source: Weiss [13]

HEI leadership need to know how to manage changes and implementing initiatives in which they are involved employee through HEI's Committees. First and foremost, leader staffs need to focus on commitment to the initiatives, they need to clearly and understanding communicate with stakeholders (teachers, researchers, administrative staff, students, alumni, entrepreneurs). They are the ones who represent expectations and goals of the institution in an understandable way from which the economy and the community will benefit. Hence, qualified, and capable members of the team managing by Committees should delas with stakeholders, support their initiatives, and be involvement in the Croatian Platform that ensures vertical/horizontal cooperation and services with various stakeholders [14]. In addition, members of Committees need to be able to represent new initiatives at the CRO Platform. In this way, internal stakeholders will acquire advanced knowledge and practice skills. Thus, employee becomes superior member of HEIs because is capable gives new initiatives that are focused on institution prosperity. At the same time, the employee feels engagement in the institution and the same time he or she has sense of community inclusion. If HEI's leaders encourage inclusive collaborative environment of members of the various Committee, individuals with diverse experience, skills and backgrounds work will contribute toward common goals (Figure 5).



Figure 5: Listed metacognitive skills required to enhancing teamwork collaborations

Source: Sosnowski [15]

A collaborative team environment is born from argued conflicts, when individuals have diverse background experiences and practical skills, goals, and opinions. This is normal behaviors in Committee working but a culture establishing of respect towards member of team has to lead to issues resolving. Thus, diverse experiences of members who work together on common goals to contribute more advanced ideas and suggestions. Moreover, acknowledgment these mindset differences are useful and always lead to creative solutions for common goals achieving. So, openness towards new ideas and suggestion, willingness to examine new possibilities prevents conflict in new formed collaborative teams. Now, members of Committee need to improve their interpersonal relationship, they need to recognize the symptoms of conflicted situations much earlier. Thus, participant starts to listen to the other team members, they together are able to deal with the various problems. In that moment are created conditions for enhancing culture of organization quality. Now, internal stakeholders reach a collaborative agreement with solidarity and harmony. They together provide various approaches in making decisions.

The high level of collaborative teamwork is based on common defining session topics, issues, problems, processes, and rules. Motivated members in Committee create an effective team that is able to accomplish strategic goals. Motivated employees take responsibility through performed various activities and data evaluations. As a result of higher motivation, employees become more satisfied because of strengthening their individual carrier opportunities. At this moment,

members of Committee are willing to build close-friendly relationships with other participants, they also want to be in charge for controlling and influencing on various activities, too. Under such conditions, the quality of HEI is enhanced by as result of collaborative environment in which employees have sense of belonging to institution, and their focus, attention and energy are directed towards achieving a mission goals. To sustain progress participants must continue to work together and this is great organization value. Individuals must be continuously motivated. The culture of teamwork is very important for enhancing operational excellence which is always based on brainstorming. It is a challenge for leaders because in the storming phase there is no establishes structure, teams work together and take responsibility to build trust, to resolve conflicts and provide resolutions. The goals finally become understandable and are supported by the participants who are active member of teamwork. All together create cohesive team, in one moment a conflict turns of in challenge to goals achieving. Participants are motivated, trust others, engaged in open dialogue, rely on each other, reach consensus, and focus to goals [16]. Finally, they need to take responsibility for developing their resources to turn matter around. The idea of academic freedom needs to be continually on the move [17].

5. ENHANCING OPERATIONAL EXCELLENCE BY PROCESS MAPPING TOOL

In a cohesive teamworking, participants stay competitive all the time because they need to continuously organize activities and resources. They are focuses on success and goals but first of all they must come up with a plan. Participant ideas need to be systematized; hence a process map can significantly help them. Mapping process represents work breakdown structure, and it is a useful tool that helps in handling with process documentation. Moreover, it is a workflow diagram that is referred to communicate how a process work. Each participant is able to understand how to complete a certain activity without lengthy verbal explanation. In addition, everyone can identify inefficiencies or improve them. Mapping tool is very useful when a recurring problem (Figure 6). It is also very easy define an individual responsibility inside of multiple team members. So, it is very collaborative tool for internal stakeholders who participates in various leader roles (HEI leaders, Committee members, holders etc.). The mapping tool is used to define the process levels, from begins to the end, so that the desired results can be verified in a correct way.

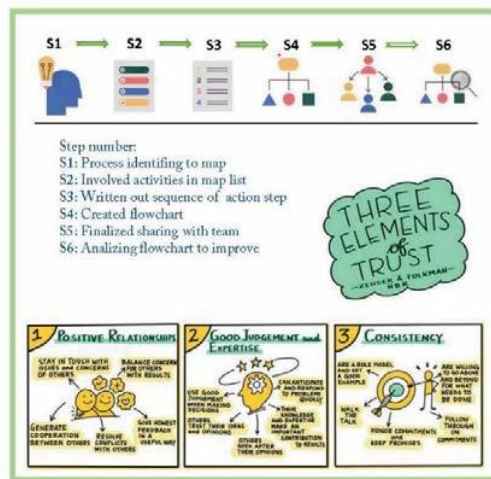


Figure 6: Mapping process work structure Source: modified from Vora [18]

Progressive teamwork collaboration needs to enhancing connectivity with external stakeholders. Moreover, HEI employees need to be curious and ask question to find answers and listen much more than speak. In addition, they have to recognize and reward good work, to make the office the focal point, to ensure that flexible working make sense for teams and finally to support more transparency.

6. CONCLUSION

Due to increasing independence of HEI, their management by dean and vice-deans is becoming more complex. HEI's tasks are diverse, so, there is a huge require for managing experts and administration experts, too. HEI teacher-researchers' staff are responsible for teaching and high quality scientific-research environment which is provide a disseminating and communicating scientific knowledge with other researchers, academics, and the community. Moreover, they tend to be a policy maker of science and technologies at domestical or/and global markets. Another important precondition for HEI's operational excellence is expansions of their services and expertise towards a community. The HEI's quality of work strongly depends on the operational work excellence of the dean, vice-deans, and administrative staff. For previous mentioned, the human resources management including HEI's organization levels and individual ones require to find effective solutions for managing and supervising HEI's strategic policies. It is important that each person who is included in HEI's system recognize the benefit of self-evaluation. Self-reflection is powerful tool for HEI's employees (strengths and weaknesses). By self-evaluation is given better potential for teamwork environment. Therefore, HEI's employees must be able to identify gaps in their knowledge. Their professional enhancing should be a challenging and realistic towards striving to growth mindsets. This means they must monitor their performances "Without waiting until the end to see how to do something". They need to enhance their competence capacities through a keeping daily record of events and experiences. So, HEI internal stakeholders need to show a major initiative to change their work environments in which they need to be focused on processes to getting better to embrace challenges and persevere. Increased competitiveness can only be achieved if the managers and holders of HEI are willing to solve the current problems. The key to continuous quality enhancing lies in self-esteem, rewards, recognition of work results and enhancing teamwork culture. However, it is also important to note that well-defined policies and procedures, together with the business process mapping system, undoubtedly help to the enhancing the quality assurance system of HEI.

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