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A COMPARATIVE STUDY OF STUDENT ENGAGEMENT IN TWO POLISH UNIVERSITIES

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Student engagement and retention are major concerns for universities around the world. It is vital to improve student retention by delivering quality education and engaging students in their studies, leading to student success and graduation and integration in the workforce. This study examines a degree of engagement in two Polish universities. The aim of this research was to evaluate and compare student engagement between two respondent groups. Data for this study were collected from 394 university students through self-evaluation using internet-based survey instrument. The differences between the universities were compared according to the current state, target state and, creative tension, describing the gap between a person's feeling of current reality and target for future. The analysis of the test results clearly demonstrated the possibility to use such an application to evaluate the students' engagement and, the comparison clearly identified considerable differences between the two university cases.

Keywords: ontology, academic commitment, engagement, evaluation, student, university, comparative study

1. INTRODUCTION

In Europe, encouraging study success in higher education has become a more important policy issue during the last two decades. The EU 2020 Strategy has

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a direct goal that at least 40 percent of 30-34 year old people should have a tertiary education qualification by 2020 (European Commission, 2015). To achieve the higher amount of tertiary degrees, only increasing access to higher education is not enough; students also must be encouraged to complete a degree (European Commission, 2015).

A major issue increasing concern in universities around the world is a low student retention, and it has become one of the biggest topics in higher education. Low retention rates have a negative effect on both the students and the academic institution. Educational institutes devote huge amounts of resources to students who drop-out and leave with incomplete educations. Often the students have accrued large debts from their studies, but they leave without a degree to get a well-paying job to compensate them (Vedder et al., 2010).

Student engagement or involvement within the educational institute can greatly influence student success and persistence. The term student engagement has become more popular in education during the recent decades, probably resulting from an increased understanding that certain intellectual, emotional, behavioral, physical, and social factors have effect in the learning process and social development (Student Engagement, 2016).

Student engagement represents the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities (Kuh, 2009). According to Harper, Quaye (2009), engagement is more than involvement or participation, but it also requires feelings and sense-making as well as being active. Research has shown that students' psychological attachment to their university, in other words, their commitment, can be a significant predictor of retention, as well as affecting many other attitudes and behaviors.

Many of the previous studies about student retention have concentrated on students' academic abilities to predict their retention. However, research has indicated that academic goals, institutional commitment, self-confidence, social support, and, for example, institutional selectivity and financial support, in addition to social involvement, have positive correlations with student retention. Students who cannot develop these factors are more prone to drop out. Previous studies have shown that the strongest factors seem to be related to academic skills, academic self-confidence, and academic goals (Lotkowski, Robbins, Noeth, 2004).

Additionally, earlier research has shown that students who are committed to a specific university are more likely to graduate than those who have the goal of graduating but feel no commitment to any specific educational institution. According to Tinto (2003), students are more likely to stay and graduate in a setting (1) that expects them to succeed, (2) that provides academic, social, and personal support, (3) that provides frequent and early feedback about their performance as they are trying to learn and persist, (4) that involves them as valued members of the institution (e.g. frequent and quality interaction with staff and other students), and

(5) most importantly, students are more likely to persist and graduate in settings that foster learning.

Also, an important factor concerning student engagement is the level of motivation toward their studies. Motivation originates from students' desire to participate in the learning process (Lumsden, 1994). Motivation has been shown to have a positive influence on students' academic performance, study strategy, adjustment, and well-being. It has been reported in primary, secondary, and college education to influence academic performance through study effort as a mediator (Vansteenkiste, Zhou, Lens, Soenens, 2005). According to Skinner & Pitzer (2012) engagement is a result of motivation. Motivation promotes engagement if students' needs for relatedness, competence, and autonomy are satisfied. Failure to fulfill these needs would lead to disengagement (Skinner & Pitzer, 2012), which present higher risks of later dropping out (Archambault, Janosz, Morizot, Pagani, 2009).

The drop-out problem is a critical issue for the university management and requires a leadership close to the students. It is of great importance to know people's performance in their study environment and to focus on their individual growth. Teachers, lecturers, and professors must support them in their studies, leading to higher commitment, which will enhance students' academic life and eventually lead to better results, and prevent potential drop-out problems.

1.1. Research objective and propositions

The objective of this research was to study and compare the engagement factors of students in two Polish universities. The comparison included selected areas that research has shown is related to student engagement such as, sense of competence, advising, justice, institutional qualities, routinization, goal commitment and social integration. The aim was to find out the current state of the university students commitment and engagement related factors and their aspirations for future and to compare these two universities to find out whether there are similarities or differences within the respondent groups. The data in this study was gathered using a new type of statement-based instrument that produces an image of individual and collective cognitive human factors. Once the evaluation has been conducted the academic staff will be more aware of the students' current feelings and possible development gaps, they have information whether and where to intervene to improve students' experiences and the quality of education and can base their objectives for improvements on concrete bottom-up results.

This paper attempts to answer the two following propositions:

Proposition 1: The degree of engaging factors and commitment can be determined in the different student test groups for management purposes.

Proposition 2: Differences of group-level results can be determined and presented visually and statistically for university management for leadership purposes.

2. ONTOLOGY-BASED RESEARCH METHOD

The disciplines needed to manage complex concepts like commitment toward one's studies and educational institute require a vast understanding of the factors affecting them, as well as sound knowledge and mastery of actions that can assist their enhancement. In order to classify and understand these concepts, an ontology was created. An ontology is a formal representation of a set of concepts within a domain and the relationships between those concepts.

Ontologies are used to reason the properties of a domain and may be used to define the domain. According to Gruber (1993), an ontology is a 'formal, explicit specification of a shared conceptualization' (Gruber, 1993). An ontology provides a shared vocabulary that can be used to model a domain – that is, the type of objects and/or concepts that exist, and their properties and relations (Arvidsson & Flycht-Eriksson, 2008). In this context, the ontology is a classification of features relating to a feeling of attachment to one's studies and educational institute. In other words, the ontology is a list of attributes that describe the metadata (features and determinants affecting commitment).

An ontology application exists on the Evolute platform. The platform has various other applications to assess and follow up the development of an organization within its various operations and functions. In Evolute there are applications for assessing organizational resources such as organizational commitment, service culture, safety culture, company democracy and, project business culture (Kantola, 2015).

The Evolute approach follows a modular process involving individuals and stakeholders, where their perception and understanding of organizational, or in this case academic resources are sought and collected with the help of statements. The Evolute system (Kantola, 2015) is a platform that computes and visualizes the meaning of the knowledge input collected from stakeholders. Management can use the computed current and future state of the resources to make a development analysis at their institution. This analysis can be made for the whole target group or sub-groups under study.

The application used in this study is called Helix Academic. The Helix Academic ontology contains 15 features analyzing students' commitment and satisfaction with their academic institution. The analysis is made by responding to 113 statements describing these features. Along with the statements, linguistic scale values are utilized. The scales vary according to the statements, for example, from 'not at all' to 'completely' or 'highly unsatisfied' to 'satisfied'. Table 1 describes the evaluated categories and their concepts in more detail.

Table 1. Evaluated categories and concepts (Einolander, Vanharanta, Chang, & Kantola, 2016)

Academic performance	
Sense of competence	Feelings about performance and competencies to study effectively
Institutional qualities	
Academic advising	Feeling of adequateness of advising and feedback received and how supportive the learning environment is
Institutional quality	How well the institution is able to provide quality in regards of teaching, people, environment and information
Centralisation	The degree of freedom and own initiative in decision-making
Distributive justice	The degree of fair treatment, recognition, performance and respect
Routinisation	Amount of challenge and development in studies
Experienced outcomes	
Utility	Feelings of external usability of studies and their results
Satisfaction	Feelings of satisfaction towards the university as a whole (teaching, personnel, courses, performance, etc.)
Stress	Feeling of potential stress based on various stressors (amount of work, vagueness of objectives, people, treatment, time, etc.)
Goal commitment	Feeling of taking responsibility for own studies and committing to goals of the courses leading to graduation
Development	Feelings of accomplishment and personal development
Social integration	
Social integration	Degree of integration to a social group related to studies
Attachment	
Institutional commitment	Emotional commitment and attachment to this particular university
Intent to stay	Intent to graduate from this particular university
Environmental variables	
External factors	Binding variables outside of study environment (obligations, family, community, etc.)

The Cronbach's Alpha (α), a measure of the internal consistency of a scale for the whole scale measuring current state was calculated to be .99 for current state and, for target state .99. Cronbach's Alpha values for different sub-features ranged at current state from .98 to .57, and for target state from .97 to .60. Two features had lower alpha values than normally acceptable 0.70. In both cases, the feature was External Factors. Even though the alpha value is less than normally acceptable, this feature was included in the scale to gain statement level insights from the respondents regarding these factors.

3. RESEARCH STUDY

Two universities in Poland participated in this study: Warsaw University of Life Sciences (WULS) and Poznan University of Technology (PUT). From WULS 224 undergraduate students ranging from 18 to 36 years of age and, from PUT 170 undergraduate students ages ranging from 20 to 36 participated in this research by responding Helix Academic application through Interned-based self-evaluation.

The mean age of respondents from WULS was 22.4 years old (STDEV 2.49), and from PUT 23.3 years old (STDEV 2.99).

The respondents were asked to evaluate the current state and the target state of the statements. By responding to current and target states separately we can identify how they feel at that moment at their institute, and also how they would like or envisage the situation to be in the future. This evaluation results in the creation of a proactive vision, i.e. the gap between the current reality and future vision. According to Senge (1990), the gap between personal vision and current reality forms an individual's creative tension which shows possible fields of improvement and intervention.

This research first uses visual analysis of the results and then presents a ranking based analysis. The purpose of the simple visual analysis is to reveal the differences in easily understandable format. The two universities were examined and analyzed based on features within the created ontology by the current state, target state and the vision for future.

4. ANALYSIS AND RESULTS

The results of the visual analysis are presented in Figures 1, 2, and 3. The light grey (top) bars illustrate the collective evaluation results from PUT, and the dark grey (bottom) bars illustrate the collective evaluation results from WULS. Vertical dotted lines present average values of all features.

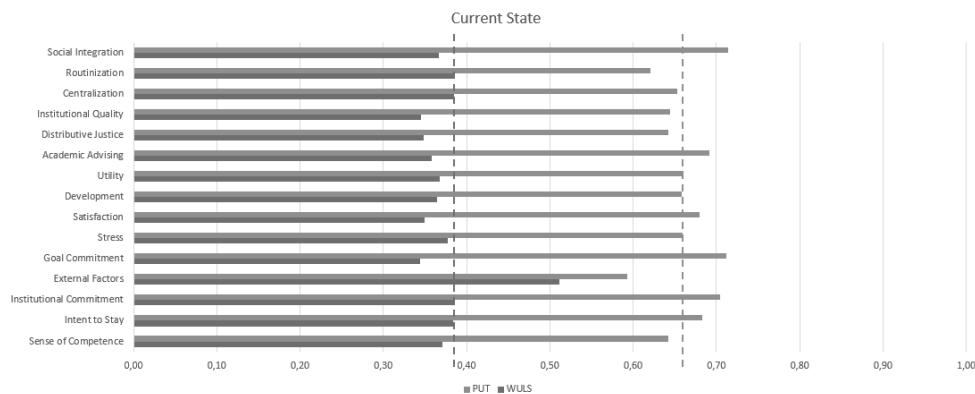


Fig. 1. Comparison of the current state

Figure 1 shows the summary of the current state research results by different topics in the in both universities. We can see visually that PUT has higher current state results in all features. Based on this basic visual analysis, the respondents

from PUT feel social integration, goal commitment, and institutional commitment to be on the highest level. According to WULS, external factors seem to be clearly at the highest level compared to other features.

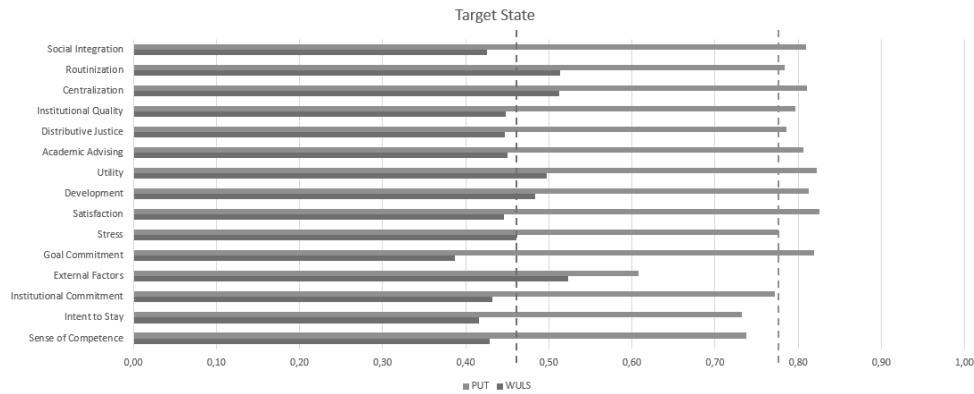


Fig. 2. Comparison of the target state

Figure 2 shows how the respondents value the future importance of each feature. Similarly, as seen in figure 1, based on figure 2 the respondents in PUT value all features significantly higher than WULS in terms of the target state.

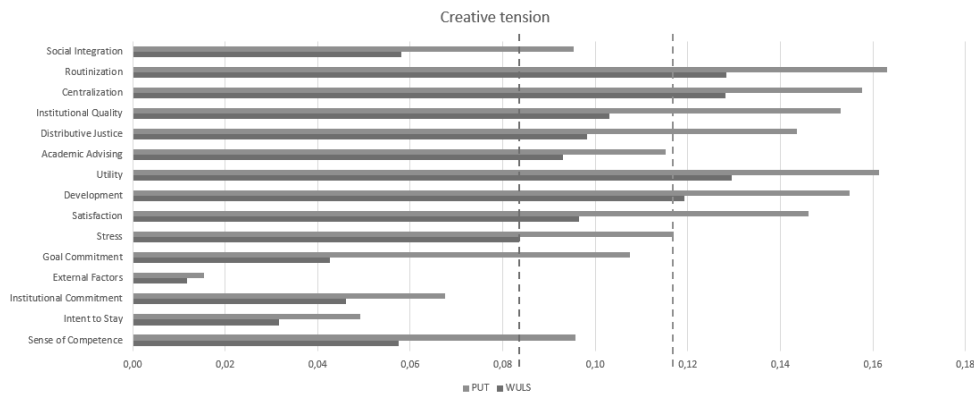


Fig. 3. Comparison of creative tension

Figure 3 shows a comparison of creative tension between the two cases. This figure highlights the need for improvement based on the respondents' answers. This figure shows clearly that PUT has more creative tension in all the features and therefore wishes to have more changes in the study environment. However, in both cases, some features have highest creative tensions. These features are routiniza-

tion, centralization, utility, and development. The feature of external factors is noticeably lower than other features when looking at creative tension. This feature describes binding variables that are external to the study environment such as family obligations. Therefore, little creative tension in this feature can be expected. Next, the ranking based analysis is presented.

Normally in human sciences sums and means are used to present group results. However, if interpreted strictly in statistical sense rankings should be used to present group results instead of direct values. Therefore, in order to make further comparisons of the cases, we treated the data by replacing each respondent's personally calculated mean values of the features with the corresponding ranking. The smallest value is replaced by the ranking of 1 and the highest value by the total amount of features. After the ranking, it is possible to calculate sums and means from the rank numbers to create group results for each level.

By using a ranking based analysis, the effect of subjective opinions of each individual responder is reduced regarding the collective results. The final group level results are based on the relationship between all answers of each respondent. This is useful because respondents who systematically experience statements, either clearly lower or higher, may have a significant effect on the average of the whole results. Table 2 presents the results of the ranking based analysis.

Table 2. Mean ranks of feature level responses

Feature	Current State		Target State		Creative tension	
	WULS n=224	PUT n=170	WULS n=224	PUT n=170	WULS n=224	PUT n=170
Sense of Competence	8.03	6.89	6.97	6.04	7.39	7.30
Academic Advising	7.36	6.95	7.46	8.17	8.76	9.71
Institutional Quality	6.90	7.44	7.51	8.55	8.55	9.41
Centralization	8.55	7.17	9.75	7.76	9.36	9.04
Distributive Justice	7.24	9.07	7.60	8.76	8.48	7.74
Routinization	8.49	6.56	9.84	8.05	8.95	9.27
Utility	7.63	8.04	9.50	10.06	9.67	9.87
Satisfaction	7.25	8.73	7.37	9.75	8.62	9.44
Stress	8.32	7.49	8.23	7.21	8.06	8.19
Goal Commitment	6.69	9.89	5.91	9.95	6.72	7.79
Development	7.65	7.96	9.24	9.39	9.56	9.56
Social Integration	7.89	9.59	6.94	8.90	7.33	7.04
Institutional Commitment	8.87	9.60	7.08	7.25	6.35	5.93
Intent to Stay	8.36	8.52	6.81	6.24	6.12	5.43
External Factors	10.78	6.10	9.79	3.93	6.09	4.28

As shown in Table 2, the dark grey areas represent features having high-level rankings and the light grey areas represent features having low rankings. When looking at current state figures, PUT has a high current state ranking in the features

of goal commitment, social integration, and institutional commitment. WULS, on the other hand, has high current state ranking in external factors, institutional commitment, and centralization. The features of a sense of competence, routinization and external factor have low current state rankings in PUT. For WULS institutional quality, the distributive justice, and goal commitment was ranked to be at the lowest level. The current state of the features indicates how respondents see their university at present.

According to the target state, PUT values utility, satisfaction, and goal commitment and ranks these features with high current state rankings. In WULS the features of centralization, routinization and external factors are valued with high-level rankings. The features sense of competence, intent to stay, and external factor has low target state rankings in PUT. In WULS goal commitment, social integration, and intent to stay have the lowest level rankings.

Regarding creative tension, PUT is experiencing that there is most room for change or development in academic advising, utility and development issues. WULS is also experiencing the most need for development in utility and development, but also in centralization. PUT as well as WULS consider the least demand for change in institutional commitment, intent to stay, and external factors.

According to these results, WULS clearly emphasizes the importance of centralization at every state. External factors are also much higher than in PUT. Regarding PUT, goal commitment and utility are seen as important. When looking at PUT's results, it is good to notice that goal commitment and institutional commitment are at high level and emphasized by the respondents. According to the results, the students should be supported on many levels. They should be supported and encouraged so that the student can achieve their individual results and then contribute in a way to the objectives of the school.

5. CONCLUSION

Low student retention and engagement is an increasing concern in universities around the world. The drop-out rate can be relatively high at the annual level of 20-30% and more depending on the university. It is important for the university management to understand student engagement and become acquainted with the various characteristics and features related to it, so rather than make decisions based on assumptions or feeling based reports, institutions can make decisions based on more objective information and directed them at important aspects of the commitment.

High student drop-out cannot be solved directly, but it could be managed more effectively in a certain way indirectly, with the decision-making based on actual information on the degree of student engagement and students' desire for improvement. If managed and lead effectively, what is achieved is the throughput of the

university improves, contributions to society are achieved at both a local and a national level, and the students feel they are receiving what they came to get from their studies. By monitoring student engagement and outcomes, institutions can identify where the current state of practices are at satisfactory level and as well as those areas in need of improvement. Operating this way, management may even improve students' engagement and commitment by demonstrating that the feedback gathered from the students have importance for management and leadership purposes.

There are several different questionnaire-based measurements methods of student engagement developed in the past. The method utilized in this study goes more detailed level in the assessment. The application is based on identifying the meaning relationships in the respondent's mind and thus gives an authentic picture of how things are experienced in their conscious experience. The application aims at a holistic view of the of commitment as the test persons feel in their own situation.

The benefits of using the system are obtained by being able to get to know the real needs of individuals more specifically. The key is to get information from the individual level, which then can be combined and analyzed and then lead at the collective level. By utilizing such an application, for the basis and support of decision making, it is possible to find concrete features of engagement that can be used to perceive, understand and internalize students' degree of engagement, and to generate a holistic view of students' current commitment and their desire to improve their degree of engagement individually and collectively. Because the application is situation-specific its use should be repeated at a future date, for example after six months, in order to see how the views of the students have changed.

This study examined the engagement of two case groups from different Polish universities. The analysis was made using visual mean value based feature analysis and, ranking based analysis. The ranking based analysis was used to get objective results of which features are collectively considered to be important.

The research was clearly able to distinguish differences between the respondent groups. The application provided information about the level commitment and engagement factors of university students individually and collectively. The comparison showed great differences between the respondent groups. These differences may have several reasons. They can be due to the school's culture, the diversity of schools and students, the student's academic (grade) level, etc. However, the analyzing the reasons for the differences is beyond the scope of this paper.

For further analysis, the variances between the respondents can be examined by viewing the distribution of the responses. When planning concrete activities this information becomes important. In addition, to make deeper analysis the respondents could be separated into, for example, three separate groups describing high, medium and, low engaged and analyze them separately. Also, this type of comparative analysis could be beneficial for university management when the comparison is made between the different units of same university or degree program. This sort of benchmarking might offer interesting ideas and talking points for management.

The theoretical framework clearly supports ontology-based data gathering to support decision-making. An ontology-based application can thus be used to compile a broad empirical understanding of engagement. This study showed a clear support for the presented propositions. We have demonstrated that the application used in this study will provide a wide-ranging view of the components regarding student engagement and, determines the degree of these factors within different student test groups. The differences were presented based on visual and ranking based analysis. In the future, the aim is to further develop the instrument and the statements based on the results of multiple research studies.

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PORÓWNAWCZE BADANIE ZAANGAŻOWANIA STUDENTÓW W DWÓCH POLSKICH UNIWERSYTETACH

Streszczenie

Zaangażowanie i utrzymywanie studentów to ważna kwestia uniwersytetów na całym świecie. Konieczne jest poprawienie retencji studentów przez ich angażowanie i zapewnianie wysokiej jakości edukacji. Badanie dotyczy oceny i porównania stopnia zaangażowania studentów w dwóch polskich uczelniach. W badaniu zebrano dane dotyczące 394 studentów w ramach samooceny przeprowadzonej za pomocą internetowego narzędzia ankietowego. Różnice między uniwersytetami zostały porównane zgodnie z stanem aktualnym i docelowym, opisując lukę między odczuwaniem obecnej rzeczywistości a celami na przyszłość. Analiza wyników testów wyraźnie pokazała możliwość wykorzystania aplikacji do oceny zaangażowania uczniów, a porównanie wyraźnie wskazało znaczne różnice między dwoma przypadkami uniwersyteckimi.

Słowa kluczowe: ontologia, zaangażowanie akademickie, zaangażowanie, ocena, student, uniwersytet, studium porównawcze