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Monitoring of Educational Performance Indicators in Higher Education: A Comparison of Perceptions

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Abstract
The purpose of this study is to explore whether there is a statistically significant difference between the ideas of university administrators and faculty members regarding how strictly Educational Performance Indicators for Educators (EPIE) should be monitored in the educational process. The responses of university directors were compared with those of faculty members, and the responses of public universities were compared to those of private universities. Improving the quality of education depends on the performance of teachers. Determining the objective indicators that measure the performance levels of teachers is necessary for maintaining quality assurance. In order for a university to maintain high standards, administrators and faculty members must cooperate with each other. The twelve point EPIE Index used in this study contains three components and nine indicators. No statistically significant relationship was found between the average component scores of university administrators and faculty members, and no statistically significant relationship was found between the average component scores of public and private universities. However, a statistically significant relationship was found between two factors from EPIE's self-appraisal scores. The model and data do not match the conceptual structure of the three components in the EPIE. Thus, further studies and analyses should be conducted. It was found that most faculty members think like academicians from private universities, and most university directors think like academicians from public universities.

Keywords: Faculty educational performance indicators • Performance indicators in higher education • Teaching appraisals • Educational performance indicators for educators

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Monitoring of educational performance indicators for educators (EPIE) has gained importance for those interested in designing education processes appropriately, improving education, and forming these processes creatively and innovatively. It is not possible for department chairs and deans to form and monitor EPIE alone. Instead, they need to cooperate and work with the other faculty members. Without this, data related to EPIE could not be collected or analyzed, and preparing and submitting meaningful knowledge to university directors would be impossible. This situation is encountered when EPIE is determined solely by university directors. University directors have a problem determining how to collect and appraise EPIE from their faculty members. What level should be monitored in collecting data from EPIE; how should it be analyzed and reported? These are all topics of recent discussion. Faculty members want to observe the benefits of collecting data for EPIE. Increasing the preparation, learning, and satisfaction levels of students; the quality and sensitivity in the education process; the transformation of faculties from the role of knowledge transmitter to the role of initiator of thought; research; and appraisal; these are all convincing factors for faculty members. This study compares the perceptions and ideas of university professors with the directors in order to determine at what level EPIE should be monitored. It was assumed that university directors would be more sensitive and have higher expectations about EPIE. One finds that organizations cause similar findings for the expectations of university directors and faculty members. At what level does the sensitivity of the EPIE for these groups bring them together? If it is at low levels, it will not only render EPIE useless, but will also put the focus on protecting internal balance instead of developing innovative and creative processes. Forming and monitoring EPIE with collaboration in higher education are important for protecting and improving the quality of education.

Literature Review

Developmental Process of EPIE: Observation of EPIE started at the end of the 1980's and beginning of the 1990's. During this time, performance reporting was considered as a main tool for policy developers and for providing information to the public (Cabrera, Colbeck, & Terenzini, 2001), (Shin, 2010). The British government declared EPIE to be a requirement in higher education with *The Green Paper* issued in 1985 (Ball & Hallwachi, 1987). The University Management Statistics and Performance Indicators Report was published in the UK in 1996 based on this requirement (Cave, Hanney, Henkel, & Kogan, 1997). Although the UK has since started to use the term *Quality Statistics in Higher Education* in place of Performance Indicators, most countries continue to use the latter. Researchers separated the terms "performance" and "intention," considering indicators as a sign instead of as an absolute appraisal unit (Sizer, Spee, & Bormans, 1992). Indicators are considered guide values for understanding whether determined goals are reached or not. However, the statistics should be reliable and valid. Performance indicators for the second group were related to education and learning when they were applied in the UK for the first time. This group focused on such values as (*a*) the percentage of students who lengthen their education and (*b*) the percentage of students who dropped out of their school (Draper & Gittoes, 2004). The number of performance indicators has increased and attracted the attention of researchers in education and learning.

Determining EPIE: Research has been conducted on performance indicators related to the education process in the class environment in addition to general performance indicators in higher education. According to Cabrera et al. (2001), universities focused on the performance indicators which showed financial stability in the past. Since traditional indicators do not show student success levels, performance indicators related to class education need to be established. In establishing these, attention needs to be given to how, by whom, and at which level these performance indicators will be determined. The current researchers were unable to find any study showing the ideas of university directors and faculty members regarding the level to monitor and appraise EPIE. Lei (2013) evaluated the monitoring concepts: innovative learning, self-learning, education atmosphere, educational interaction, educational guidance and inspiration, the selection of education materials, defining hard tasks, practicing new education concepts, and innovation in education methods. He, divided EPIE's into six categories: education goals, education behaviors, education atmosphere, learning attitude, education characteristics and innovation, and self-developmental ability of students. He organized these six indicators in four dimensions and analyzed them with fuzzy logic theory. Fernández et al. (2011) defined organizational performance indicators as "objectively appraisable corporate objectives." They

tried to appraise performance indicators using the Bayesian network method even though it had no statistical base. Popa (2011) conducted a study on the importance of performance indicators which are mostly qualitative yet sometimes quantitative, and she found that they are very important tools for appraising education activities. According to Popa, the Council for Higher Education Accreditation defines EPIE's as "... the outcomes and findings of the education program and education process. Indicators are tangible indicators used to make announcements to the public in a socially responsible and transparent manner." While Sousa and Veiga (2009) suggested that indicators can be quantitative, the current researchers believe that qualitative data is more reliable.

Cuenin, the pioneer of EPIE studies, established the minimum condition for performance indicators as "digital values that may be used for assessing the quantitative success of a system" (Ball & Wilkinson, 1994). It is understood that Popa gives particular importance to performance indicators in her study. The approach used in this study, however, concentrates solely on the establishment of the success indicators that belong to academicians through the education process. As an initial study, ascertainment of administrator and academician opinions regarding the correct level of how to monitor the determined EPIEs was researched. Under this context, the education process starts when the academician prepares a single semester course program, proceeds with timely presence in the class, teaches the course efficiently, measures student learning, and ends with satisfied students. The other performance indicators that affect education quality globally require organization variables rather than just the educator's performance. These are not within the scope of the current study.

Educational Performance Indicators Covered under Input, Process and Consequences: Education performance indicators may be divided into three groups: beginning, process, and results. The beginning defines the input indicators, among which are educational expenses per student, general indoor area per student, classroom area per student, student-teacher ratio, number of students per student affairs officer, number of students per computer, social activity expenses per student, and so on. Input performance indicators are related to the educational infrastructure of the organization and define the financial, physical, and human resources necessary to provide quality training. Popa used a model developed by Kirkpatrick in assessing the educational process. This model foresees at least four levels for assessing education with each level including at least one indicator. The four levels from Kirkpatrick are satisfaction with the education received, with the level of acquiring knowledge, with the level of knowledge reflected in the behavior of the student, and with the organizational results. The final level decides whether the program is successful or not (Popa, 2011). Some performance indicators related to the results of education are timely graduation rates, dropout rates, scholarship acquisition rates due to success, employment rate within six months of graduation, GPA percentages higher than 3.0 or 3.30 (based on a 4.0 grade scale), the percentage of graduate students who take the ALES exam (the test required to enter graduate school) and score higher than 70%, the rate of students who enter the foreign language exam (YDS) and score at least 65%, and the rate of the students continuing on to graduate studies.

As is seen, existing performance indicators linked to the results show whether the four year education process has been successful or not. However, these indicators are related to the completed stage of the process. In order for such indicators to obtain good standing, one should determine and improve certain performance indicators. Thus, researchers have concentrated on such titles as "the frequency of weekly library use by students," "how often students participate in group activities," "how readily leadership positions are assumed," "homework completion levels," "whether students solicit and receive opinions from their advisors on their research topics, courses, and so forth" (Gaither, Nedwek, & Neal, 1994). The purpose of the current study is to focus on the education process, leaving the input and output performance indicators in the hands of other researchers.

Performance Indicators Related to the Education Process: Performance indicators within the education process may be handled in three groups: (*a*) performance indicators focusing on students, (*b*) performance indicators focusing on academicians' teaching responsibilities, and (*c*) performance indicators focusing on the administration. An important portion of educational activities is related to the organizational and administrative processes, not to the teaching-learning process. For instance, the number of students per academician, class size, frequency of technology use in education, number of new enrollments, how beneficial education programs are, and the proportion of academicians conducting scientific research and related activities are some of these types of indicators (Serdar, 2010).

Since the education process must be considered as a whole, the effect that the administration has on education should not be underestimated. With this being said, however, only academicians' educational responsibilities were focused on in this study. The main functions of vice-deans and division heads responsible for academic affairs is to improve educational processes directly related to academicians and assist them in overcoming the difficulties they face when making such attempts.

Karsten, Visscher, Dijkstra, and Veenstra (2010) claim that although the educational performance indicators that bring prestige to an organization show the relative superiority of that organization, they may not provide an idea as to whether absolute educational standards have been fully met or not. Since absolute educational standards do not have a generally accepted definition, higher education institutions compare their positions over a specific period of time or against the values of another institution that they accept as superior. In doing this, they try to place themselves in a specific position. Karsten et al. (2010) claim that education performance indicators should meet "strict methodological parameters," in other words, the validity, reliability, and integrity of the parameters. An additional parameter, "usability," may be included. Some indicators do not have visible or understandable results, and others may even demonstrate rather uncertain results. Both academic directors and academicians should carefully determine and monitor the performance indicators which clearly generate "added value" and have a positive effect on student development. Twelve theoretical educational-performance indicators in this study have been selected and named Educational Performance Indicators for Educators (EPIE). The basic characteristic of performance indicators is to provide information as to the how frequently academicians realize their initial targets. For the EPIE system to function properly, it must be meaningful for academicians, useful for the organization, and include easy data compilation methods and means of reporting. Several studies have been performed aiming to determine performance indicators. For instance, Chen et al. (2009) gathered data from higher education institutions using the Delfi method, determining 78 performance indicators falling under 18 dimensions. They then attempted to generate an organizational balanced scorecard for higher education institutions depending on such performance indicators (Shun-Hsing, Hui-Hua, & King-Jang, 2009). The study of Shun-Hsing et al. covers the entirety of the organization. However, determining those performance indicators which focus only on the education process and those which increase academician engagement in the actual educational process are more important for department heads.

The twelve theoretical educational-performance indicators as determined by the researchers are meaningful for universities in Turkey that want to reach their educational goals. The important thing is not to increase the number of performance indicators but to generate a change in behavior by using fewer indicators so as to increase academician effectiveness and efficiency, maintain student satisfaction, and assist in the development of the education process.

Consensus between Administration and Academicians on Performance Indicators and their Level of Implementation: There is a need for administrators and academicians to reach a consensus as to what performance indicators should be and what degree they should be implemented and monitored. If such a consensus can be reached, the process will become part of the organizational culture and gain permanency. Otherwise, even if the most useful performance indicators are determined, they may not be fully implemented or monitored. The level of importance for performance indicators differs for university chancellors, faculty deans, and department heads. Although chancellors and deans give a great degree of importance to educational and learning activities, they either don't demonstrate the same level of sensitivity to the details of educational and learning indicators or they don't allot time to the data and tables presented to them. Department heads, on the other hand, try to increase the number of educational indicators. Since educational performance indicators are related to the success of the department. Further, educational performance indicators reflect on other indicators in one way or another. It is important that department heads perform joint activities with academicians and determine together which indicators should be used and to what degree they should be implemented and monitored.

Question and Goal

The question addressed by the study is bi-directional. First, what EPIE should be and to what degree it should be implemented and monitored. For this, first aspect, there exist differences (*i*) between public and private universities and (*ii*) between directors

and academicians. The second aspect is the fact that individuals may think differently as to the extent that EPIE should be monitored depending on self-assessment types. The lack of consensus on the extent that EPIE should be monitored then prevents them from being effectively implemented. The very existence of educational performance indicators for educators may even be questioned in Turkish universities. Global performance indicators currently being applied by certain universities only have a limited effect on improving the learning process. EPIE should be determined and monitored at a specific level so as to enable universities to compare the quality of education they offer. The goal of this study is two-fold. The first is to compile the opinions of university directors and academicians as to what extent that EPIE should be monitored, and the second is to establish relations between the EPIE scores according to certain demographic groups such as private universities, public universities, and self-assessment groups.

Method

Design

This study is basically descriptive, but also may be defined as inferential research, which includes the testing of certain hypotheses. Educational Performance Indicators for Educators, which consists of twelve indicators, was selected as the basic conceptual structure and handled theoretically under five dimensions: (*a*) monitoring the teaching course, (*b*) monitoring the use of course materials, (*c*) monitoring the course success of the students, (*d*) monitoring the attendance of the students and (*e*) monitoring the course satisfaction of the students.

No study based on the classification of performance indicators using a scale-index could be found in the literature. The aforementioned sub-dimensions may differ according to the specific branch of science being studied (whether the university's focus is on research or educational activities) and the size of the university (big or small). After going through the literature, it was found that the five above-mentioned dimensions had covered the *academician based education process*. The model of the study began by examining the relations between (*a*) public and private universities and their EPIE component average scores, (*b*) administrators and academicians and their EPIE component average scores, and (*c*) self-assessment groups and their EPIE component average scores.

Population and Sample

Although the current researchers had aimed to collect the study's data from universities in Istanbul, due to an insufficient number of answer sheets, also some universities in Anatolia were chosen. Since the hypotheses of the study depend on the comparison of (*i*) public universities and private universities and (*ii*) opinions of administrators and academicians, the sample size was determined to meet minimum calculation requirements. Since a 12-item ipsative scale was used, the researchers aimed to reach a number of participants at least 15 times the number of items on the scale. Considering that some of the surveys distributed would not be returned, it was decided that a total of 200 surveys would be distributed, half of them given to administrators and the second half to academicians without any administrative responsibilities. In the same manner, half of the surveys were intended for public universities and the other half for private universities. The population and unit of measurement consists of instructors, all from universities in Turkey. Assistant professors were deemed to be a part of this group since they teach classes. More than 300 surveys were sent to randomly selected universities with 176 being returned. Of these 176, five surveys were eliminated for the other reasons, rendering a total of 171 surveys forming the sample group. The survey return rate was 59%.

Measurement Tool and Implementation

Two structured survey forms were used in the study. The first form was developed for administrators and the second for academicians. Both survey forms are composed of the same content, save for two questions in the demographic section. Those questions not related to administrative roles and activities were deleted from the academician forms and some expressions related to performance indicators were changed to render the survey suitable for this group. The measurement tool consists of two parts. In the first part, demographic questions related to employer organizations, branches of science, and academic titles were asked to both administrators and academicians. The second part of the survey consists of a behavior-anchored rating scale. The characteristic of this tool is that it provides five different behavior options to respondents in relation to a certain performance indicator, asking which options best suits the respondent. The second measurement tool is "The Scale of Level of Participation to Performance Indicators." This scale was developed based on both the

researchers' experience in academic administration and also the literature review. It was concluded that it would be most beneficial to limit the items to twelve indicators. Both survey forms consisted of six pages and took about 30 minutes to complete. A part of the survey was conducted via face-to-face interviews and the remaining surveys were sent to academicians via email. The behavior-anchored scale is a type of a formative scale focusing on validity rather than reliability. As such, the validity analysis of the items was tested on a pilot study performed on a small group. As the scale used in the study is not a reflective scale, neither factor analysis nor specifying reliability were applied. It is known that in formative measurement models, statistical techniques are insufficient both for evaluation and for determining the reliability of manifest variables (Gudergan, Ringle, Wende, & Will, 2008). Since manifest variables in formative measurement scales constitute the structure, they are named as composite variables. The hidden conceptual structure is not disputed (Freeze & Raschke, 2007). Again, according to the same writers, the internal consistency between items (reliability), correlation between items, and error scores were not investigated (Freeze & Raschke, 2007, p. 1484).

In the Behavior-Anchored Rating Scale, 5 levels were specified and each one of these levels was organized in a way that they could include the other. As such, a participant marking the fifth level means that this participant thinks it absolutely necessary to monitor performance indicators. A score of 1 or 2 indicates that the respondent believes that the monitoring level should be at a minimum whereas a score of 4 or 5 indicates the opposite.

Variables

Dependent Variables: Each item in the 12-item behavior-anchored scale was determined as a dependent variable. When the aforementioned sub-dimensions are taken into consideration, it is seen that five items relate to teaching style, four items to the use of course materials, one item to student levels of success in the course, one item to measuring satisfaction levels, and one item to measuring attendance. These dimensions were taken as group variables. The measurement tool used was not an attitude measuring scale aiming to reveal a hidden structure, and accordingly, the rule of "at least three items" in determining a dimension could be disregarded. The twelve dependent variables were established to ascertain the following: (*1*) *The attendance rate of academicians*. This indicator aims to understand how many times in a semester an academician did not attend class or sent an assistant instead. (*2*) *Whether academicians started and ended class on time*. This indicator aims to establish how frequently the academicians starts and ended class by means of three random checks to be performed in a single semester. Moreover, any related student complaints could be added to this indicator. (*3*) *The course's presentation* (teaching style). The aim of this indicator is for the academician to self-report regarding their ability to successfully implement the predetermined teaching methods and techniques. (*4*) *Academician relations with their students*. This indicator aims to obtain the department head's assessment of the academician using a five-level scale. (*5*) *The means used to enrich teaching methods*. This indicator asks the academician to self-report as to the percentage of the audio-visual material actually used that had been planned for use at the beginning of the semester. (*6*) *How strictly academicians followed to the syllabus*. The aim of this indicator is three-dimensional. The first dimension is to keep up with planned timing, the second is to comply with the plan, and the third is the review and update of the plan (Kurz, Mueller, Gibbons, & DiCataldo, 1989). (*7*) *The use of course materials*. Using all educational materials for which the academician held the students responsible for. (*8*) *Academicians' compliance with set theoretical lab hours*. This indicator asks the academician to self-report as to what extent they complied with planned laboratory or exercise hours. (*9*) *Academicians' use of the course book*. This indicator aims to determine the rate an academician used the recommended course book in measuring students' learning. (*10*) *Academicians' attendance-taking performance*. This indicator aims to determine how strictly the academician keeps attendance records of students in compliance with the stated policy. (*11*) *Student satisfaction levels*. This indicator aims to measure how satisfied students are with the course and provide feedback to the academician. (*12*) *Success of the lessons taught*; this indicator aims to have the academician distribute a form gauging class success and then consider the results while making assessments.

Scale Levels: Each of the measurement items is evaluated using behavior and attitude expressions classified under five levels. The expression "academicians should be completely free" is coded as a "1" and the phrase "academicians should report to management under the established system and prepare statistical data" is coded as a "5." The intermediate levels of 2 through 4 measure how strictly respondents believe that the indicators

should be monitored. The most relaxed view is to let academicians be completely free, to allow them to act under their own academic discretion. The most strict view supports the structured process, requiring academicians to regularly compile specific digital data to be reported to the administration and to prepare concrete, monitorable, and measurable data at the end of the semester. Between these views are ones which hold that academicians should be tracked; tracked and provided with explanations; or tracked, provided with explanations, and required to provide feedback to students.

Independent Variables: 19 independent variables were determined for the administrator group and 18 for the academicians. These are as follows: (1) the type of institution, (2) administrative position, (3) title, (4) administrative experience, (5) branch of science, (6) quality assurance committee, (7) age of the quality committee, (8) self-assessment applications and the age of such practices, (9) the performance of scales gauging satisfaction, (10) how frequently satisfaction scales are used, (11) satisfaction measurements, (12) feedback received from satisfaction scales, (13) keeping up with the syllabus, (14) compliance with the syllabus, (15) permissions for course materials to be copied, (16) yearly activity reports, (17) board minutes, (18) how often board meetings are held, and (19) personal self-assessment. On the one hand, the independent variables aim to obtain non-personal academic information about academic administrators and academicians, and on the other hand, they aim to establish whether or not quality works and performance indicator practices exist in their respective institutions. Since some of the independent variables were related to the dependent variables, whether there existed a relationship or not is what was examined.

Research Questions and Hypotheses

The independent variables were deemed as research questions and were also used as an instrument to test the hypothesis. The findings of the research questions have been summarized in a table. The aim of constructing such a summarized table is to ensure that a global assessment is being made about the independent variables. The following hypotheses whose aims are to draw conclusions and reach certain judgments are also tests in the study:

1. The average scores of academicians differ from administrator scores in their understanding of EPIE components.
2. Both the self-assessment and average scores under EPIE components differ from one another.

The values belonging to the three independent variables were obtained in relation to the average scores of the three EPIE components. The reason for using the average scores of the components instead of the total score for the EPIE is that the correlation coefficient of the dimensions was found to be relatively low. Moreover, the behavior-anchored rating scale that was used is not regarded as a complete index.

Analysis

After the frequency distribution for an important part of the demographic data in the measurement tool had been found, central distribution statistical computations were performed for two variables with differing data structures. To see the distribution of the participants through behavior-anchored rating scale items, the benefits of the box graphic were used. In order to reduce the dimensional structure of the rating scale, exploratory factor analysis was performed. In order to compute the number of components, the eigen value and scree graph techniques were used. The purpose here is to establish which education performance indicators are not in accordance with the assumed dimensions but are in accordance with the results of the calculations. It is thus possible to test whether a relation exists between the average scores of the covered variables by arranging components and the demographic variables. Either the t-test, for two independent samples, or the single directional variance analysis was used to test the hypotheses depending on whether the demographic variables had two alternative or multi-alternative content.

The reason for choosing the method of explanatory factor analysis was that no factor structure related to educational performance indicators had been conceptualized yet in the literature. Since the twelve items are grouped under three components, and since such components are related to each other at a medium level, the *oblique rotation technique* was applied and then each component was subjected to either a Cronbach alpha internal consistency analysis or a reliability analysis. A limited pilot test was performed to establish the validity of the scale's items. This test required three research assistants to assess the educational performance indicator items via a five-level scale. Research assistants examined the scales surface, content, and internal consistency validity. Both inter-item

and item-total score correlations were performed to test internal consistency. The feedback from the assistants was considered and the required corrections were performed. The double per time correlation analyses that was performed showed the correlation coefficient between the arbitrators to be between .82 and .90 ($p < .000$). The Cronbach alpha reliability coefficient of the scale was determined to be .92 after assessment from the three arbitrators during the preliminary stage.

Findings of the Study

Findings from the Study Questions

This section first provides the general results of the independent variables and then compares the results of the Educational Performance Indicators Scale between (*i*) administrators and academicians then (*ii*) private universities and public universities. Finally, the respective distribution graphics are presented. The final scale items of the educational performance indicators comprised of three components and nine items were determined by factor analysis. The nine items are known to have a high level of reliability.

Box Graphics Depicting EPIE Monitoring

It has always been wondered how administrators and academicians assess the implementation and monitoring of educational performance indicators as well as how they are distributed. This curiosity relates to whether there is a dispute or acceptance between these two groups exists, and if so, to what degree. Undoubtedly, it is best to have a high level of shared acceptance so as to increase the overall quality of the educational process. The respective analysis has been made using the distribution graphic, *box graphic*. The y-axis demonstrates approval levels toward EPIE, whereas the x-axis indicates any existing administrator function or university group. Each graphic handles one of the nine variables in the final scale, which were determined through factor analysis. These variables are as follows: academician attendance, timeliness in arriving to and leaving from class, course presentation, enrichment of teaching style, compliance with the course plan, course materials, basic course book, monitoring student attendance, monitoring student satisfaction, and monitoring course success. The first graphic provides the results according to management duties and the second graphic provides results according to university type.

1. Academician Course Attendance: The opinions related to the monitoring of academician course attendance may differ. As the difference between the expectations of the directors and approaches of the academicians increases, the organizational structure and education standards are harmed. Figures 1 and 2 demonstrate the opinions of the participants as per the roles of director and academicians and on the basis of being a private university or a public university.

If one interprets the box graphics, it can be seen that despite the same median values for the directors and academicians in Figure 1, 50% of academicians believe that the task is their own responsibility and expect lesser control exerted on them. Considering Figure 2, the median value in private universities is 2, whereas it is about 2.5 in public universities. The greater variance in public universities means that the opinions on "monitoring" are more widely distributed. Private universities, on the other hand, demonstrate a more regular opinion starting from a medium level of monitoring towards letting academicians be totally unmonitored. It may be

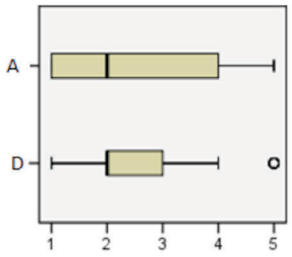

Figure 1: Results of variable 1 for the academician and director groups.

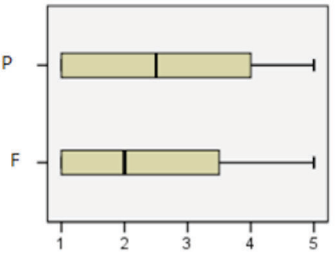

Figure 2: Results of variable 1 for the public and private university groups.

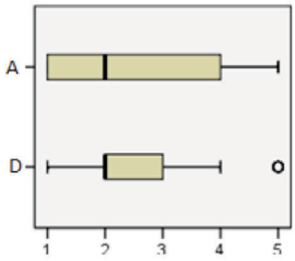

Figure 3: Results of variable 2 for the academician and director groups.

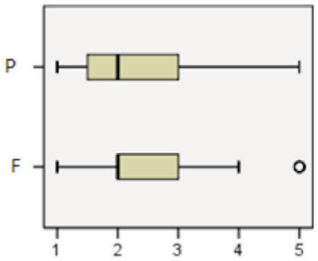

Figure 4: Results of variable 2 for the public and private university groups.

understood that the management approach of the private sector is more or less reflected in the behavior of the people. A portion of the people in public universities thinks that much more serious monitoring and control is necessary.

2. Timeliness of Academicians in Arriving and Leaving: The second item in the fore plan, thanks to factor analysis, is related to the timeliness of academicians in arriving to and leaving from class. The respective results are given in Figures 3 and 4.

When examining the figures, it may be seen that the approach of the directors and private universities are similar. The academicians demonstrated a wide range of opinions about monitoring their class arrival and departure routines. However, in general, more than 50% demonstrated opinions desiring more freedom on this item. This dominance most likely originates from the structural factors of public universities.

3. Academician's Level of Applying the Teaching Methods and Techniques: The teaching techniques item starts with distribution of the course programs to the students at the beginning of the semester and covers course conferences, an interactive evaluation, homework assignments, presentation sessions, and mentoring or consultancy techniques. Monitoring the abilities of the academicians to apply such techniques and identify the levels in which the techniques should be applied will increase the frequency of use and number of techniques used. The responses of the participants are given in Figures 5 and 6.

The median value is two for the academician and director group, meaning that the academicians do not want over-interference in their teaching methods and techniques. However, a significant number of the academicians provided opinions showing permission for the monitoring of their teaching styles. This approach may arise from a sort of dissatisfaction. The private and public universities group, in turn, do not demonstrate a serious difference. Both organizations deemed that providing "certain recommendations" for "teaching methods and techniques" would be sufficient. The real difference lies in the perceptions of the academicians and the expectations of the directors. The academicians expressed that in their opinion "a report is necessary at the end of the semester in relation to the level of implementation of the teaching methods and techniques."

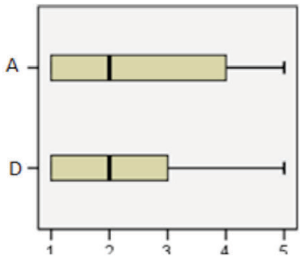

Figure 5: Results of variable 3 for the academician and director groups.

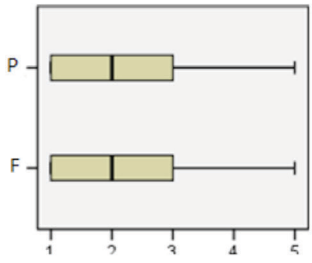

Figure 6: Results of variable 3 for the public and private university groups.

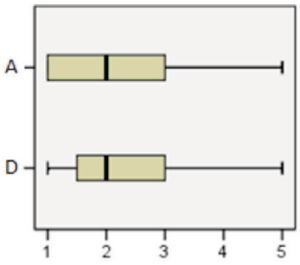

Figure 7: Results of variable 4 for the academician and director groups.

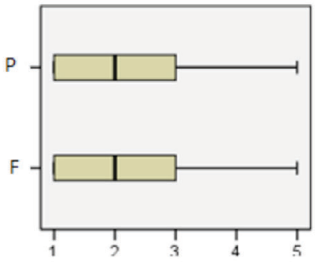

Figure 8: Results of variable 4 for the public and private university groups.

4. Enriching the Course Teaching Style: Enriching the course teaching style means assigning homework to students; requiring presentations; making students use internet sources; the use of projection devices; and favoring surveys, photographs, and article evaluations as additional learning tools. The item *teaching methods and techniques* is closely related to *enriching the course teaching style*. The conference method, allowing student participation, and consulting with students are all approaches in the fore plan of teaching methods. However, the material used for strengthening the course becomes more important for enriching it. The results of the assessment are provided in Figures 7 and 8.

The results resemble those for the item *teaching methods and techniques*. No serious difference is observed between private universities and public universities. However, academicians stated that this item should be their responsibility in most cases when compared to the opinions of the directors. Seventy-five percent of the academicians marked three or lower.

5. Monitoring the Course Plan: Monitoring the academicians' course plans (teaching plan) that teachers decided at the beginning of the semester and keeping up with such plans is another area deemed significant for educating students in a quality manner. The division heads may monitor on several levels whether the academicians keep up with their teaching plans. In general, a wide range of practices exists, starting from solely monitoring until eventually warning the academician about the matter. The results under this educational performance indicator for the directors and academicians are provided in Figure 9, and for the private universities and public universities in Figure 10.

Seventy-five percent of academicians have a median value lower than 2 and approximately 50% of the directors marked a median value in the same range. Thus, 25% of the academicians thought that this item should be handled more strictly. At least 50% of the academician group thought that semester course plans fall under their responsibility. Twenty-five percent, in turn, demonstrated a more open approach to managerial controls. A parallelism is present in the opinions of the academicians and public universities. The distribution of the opinions of the director generally indicates similarities with the opinion profile of private universities. Private universities give more importance to monitoring the course and teaching plans as well as making adjustments to the same when compared with public universities.

6. Course Materials: This variable examined whether academicians prepare their own course

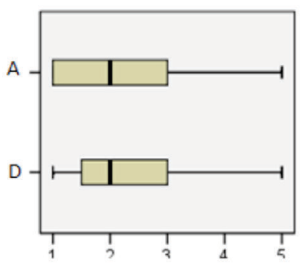

Figure 9: Results of variable 5 for the academician and director groups.

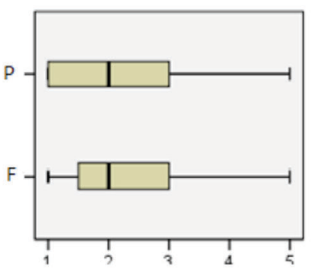

Figure 10: Results of variable 5 for the public and private university groups.

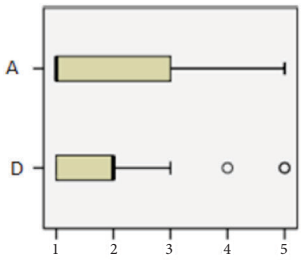

Figure 11: Results of variable 6 for the academician and director groups.

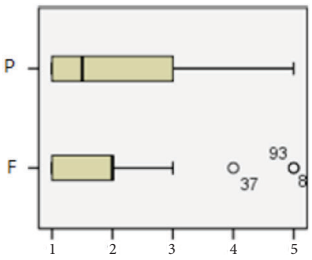

Figure 12: Results of variable 6 for the public and private university groups.

books or notes in relation to their courses, the number of pages or sections from the book that they hold students responsible for, and the course materials that comply with the teaching (course) plan. Some problematic practices may be exemplified such as holding students responsible for a 600-page book, making students write 50 to 60 pages of course notes throughout the semester, comprising exams based solely on class notes, and so forth. The manner of using course materials should be monitored in this way if the aim is to monitor educational performance. It is important that academicians make their own selections while keeping the educational knowledge load and intensity on the students close or equal to the omnipresent norms. Figures 11 and 12 provide the distribution graphics for both groups.

The median value of academicians for the development and use of course materials and volume for which students will be responsible was found to be 1. The median value for directors is 2. This means that academicians perceive this area totally under their responsibility. When one looks at the director group, it can be seen that they resemble a wide range reaching the level of "recommending." Public universities also demonstrated a range reaching "statistics formation." Fifty percent of academicians marked higher than the "general monitoring" item, whereas this percentage was only 25% in the director group. This variable can then be understood as "underestimated" by the directors. Fifty percent of academicians desired total freedom, and the remaining 50% requested more control and monitoring, which consequently forms a spiral structure in which the components feed each other. When one compares private universities and public universities, close median values are observed (1.5 for public universities and 2.0 for private universities). The perception of "trust" may be felt in private universities, whereas public universities make a strong notion of the need for control and monitoring. At least 25% of the participants from public universities provided opinions in line with higher-level monitoring and control.

7. Basic Course Book: It is deemed favorable for the education process that courses are taught in the framework of a well-structured and well-adjusted course book according to the level of the students, one that provides sufficient details and depth. Such a book should not necessarily include all

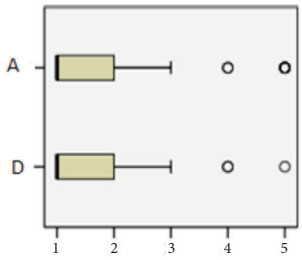

Figure 13: Results of variable 7 for the academician and director groups.

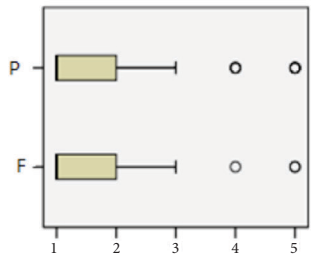

Figure 14: Results of variable 7 for the public and private university groups.

the subjects of the 14-week curriculum. It should, however, be a source work suitable for any time reference, extending and easing the context of learning for students. Monitoring the availability and competency of the basic course book and making use of other books, articles, research, and course notes are factors that will assure the quality of education as an educational performance indicator. The responsibilities related to the qualities of the basic course book and other course materials may be left totally to the division heads or academicians, or they may be monitored at certain levels. Observing such qualities means that this variable is a performance indicator. Figures 13 and 14 provide the distribution graphics for the director and academician groups and the private and public university group.

All the groups demonstrated a common attitude in relation to the item *basic course book*. This comes in the form of "showing general interest" and "checking if the basic course book has been picked or not" among 75% of the participants. Twenty-five percent of all groups provided opinions approving "holding meetings with academicians in relation to basic course books" and "making recommendations to academicians in such meetings as related to copyrights, number of pages for which students will be responsible, photocopies, etc." These participants provided opinions that show a desire for advanced works to increase educational quality and improve the processes.

8. Monitoring Educational Satisfaction: Monitoring the student level of satisfaction with their course and instructor is a frequently preferred method for improving educational processes. However, many universities do not have a well-thought-out, planned, systematic method for "measuring student satisfaction." As satisfaction with the university, program, course, teaching method, and academician mix with each other, the results of such measurements do not provide the level of desired contribution for improvement of the processes. Under this variable, 1 means "academician does not trust measurement results," 2 means "general assessment," 3 means "find quite valuable and worthy of importance," 4 "feedback about the academicians via a closed envelope, including a review of their behaviors," and 5 "keeping related statistics and performance of periodical comparisons over many years." The results are given in Figures 15 and 16.

Fifty percent of the participants in all groups positioned themselves in the choices "general assessment" and "find quite valuable." The percentage of the participants who "do not trust the measurement results" and "request feedback about the academicians via a closed envelope, including a review of their behaviors" were both at 25%. It may be understood that certain policies are required to turn the ideas of the 25% (deem such monitoring as unimportant) to a more positive array. It may be achieved by making the approach of measurement, the methodology of measurement, measurement tools, and analysis methods healthier. One should also not assess the position of the 50% group as a healthy placement. This position points out a procedural implementation. To improve education processes, an important portion of the participants should position themselves at 3 or higher. It would be favorable if the university directors stop perceiving satisfaction measurements as automatic processes, but on the contrary, as a significant work whose results will be assessed and discussed by the division or main-branch boards. Since no differing structure could be seen between public universities and private universities, it may be said that this implementation is realized using a similar approach in both organizations.

9. Monitoring Student Success: Universities generally do not monitor what percentage of students

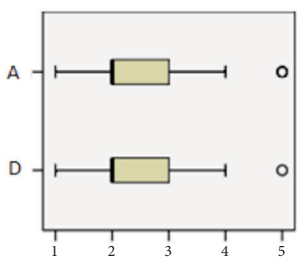

Figure 15: Results of variable 8 for the academician and director groups.

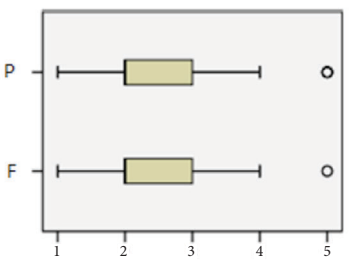

Figure 16: Results of variable 8 for the public and private university groups.

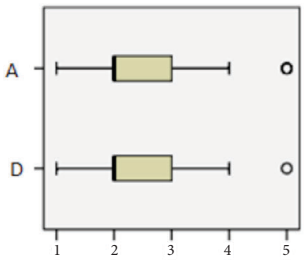

Figure 17: Results of variable 9 for the academician and director groups.

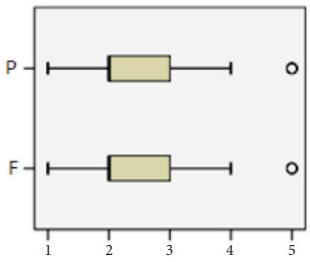

Figure 18: Results of variable 9 for the public and private university groups.

pass a course, fail, or repeat the same course for their second or third time. To stay a step ahead of this, one can examine the success rates and distribution of successful students under five levels. In a way, monitoring student success reveals the success of the academician. Designating most of the students as successful or unsuccessful, a very high or low general grade level may provide an idea about the measuring approach of the academician. If success reports are not monitored, then academicians may move out of a "reasonable" measurement standard. In relation to monitoring success, 1 means "I do not perform success monitoring or grade distribution assessment," 2 means "I generally monitor success rates," 3 means "I make a related distribution assessment at the end of the semester," 4 means "I prepare a report on the success of the course at the end of the semester," and 5 means "I monitor the statistical developments over years." The results are given under Figures 17 and 18.

A similar distribution is seen for all groups. The academicians, directors, private universities, and public universities provided a "general monitoring of the course success" with a median value of 2. Fifty percent of all participants from all groups provided their opinions as "generally monitoring or conducting a general assessment at the end of the semester." Only 25% of the participants rose to the level of "I make a related distribution assessment at the end of the semester." The success rate and success distribution of each course should be assessed by the division and main branch boards. However, in many universities the divisions and academic boards of the main branches do not perform work on the quality of education.

Findings Related to Factor Analysis

The oblique rotation technique as well as the method of basic components analysis were applied in this study on the 12 items of educational performance indicators, aiming to reduce the number of indicators by means of establishing underlying dimensions or revealing unrelated indicators, thereby only including the related indicators with high representation in the final scale. A total of 171 valid surveys were assessed. Five surveys were eliminated on several grounds. Maxwell (1959) and Tobias and Carlson (1969) recommended applying the Bartlett sphericity test before implementation of factor analysis (Dziuban & Shirkey, 1974). Thus, a chi-square value of 965.85, sd. 66, $p = .000 < .05$ was obtained. The p value being lesser than .05 means the H_0 hypothesis testing the unrelatedness of the variables in the population was rejected. The second stage applied the suitability test of Kaiser–Mayer–Olkin on the sample size. The test requires this size to be at least .60. The OKM test value was calculated at .854. This result proves that the sample size is sufficient for obtaining factors or for assessing the arisen factors.

The Kaiser parameter is defined as 1 for finding factors, and the scree graphic is also used. The self-value of a factor (eigenvalue) shows the amount that the variance is explained by such a factor. Since one can assume that the indicators under the EPIE scale are related to each other, oblique rotation is preferred. The following results were obtained from the factor analysis results performed in line with the aforementioned explanations.

According to the correlation matrix, it was seen that most of the variables are related to each other at .30 and higher. The communalities provide the partnership percentage of each variable with the factor. The values under the extraction title show the variability percentage of an item caused by the related factors. The communality value of the first variable was found to be .792, meaning that 79% of the variability of this item may be explained by the respective factor. The sub-limit for the communality percentage is .30. In other words, items having a communality rate less than .30

Table 2
The Component Loads of the Education Performance Indicators Scale

Variables		Component 1	Component 2	Component 3
v7	Course materials used by the academician	.849		
v9	Monitoring the Basic Course Book	.812		
v5	Enriching the Teaching Style	.750		
v6	Keeping in line with the Teaching Plan determined at the Beginning of the Semester	.734		
v1	Attendance of the Academician		.888	
vv2	Academician Timeliness in Entering and Leaving the Class		.887	
v3	Teaching Style, Presentation, and Course Management of Academician		.835	
v11	Monitoring of Student Satisfaction			.817
v12	Monitoring the Course Success of Students			.802

should be favorably eliminated from the scale. The communality values of all 12 variables of the study were found to be higher than 0.30. Factor analysis showed three factors with self-values higher than 1. The total variance explanation percentage of these three factors, cumulatively, is 66%. In terms of total variance, the first factor explains 44.8%, the second factor, 11.9%, and the third factor, 9.2%. The pattern matrix and structure matrix tables were examined all together to establish which items would be in the final scale and which items would be taken out. Table 2 lists the correlation coefficients of the variables with the factors. The intersection point of the variables with the factor loads should not be determined independently, but in line with the frame of the figures from the literature. According to the literature, it is generally more logical to take items with factor loads higher than .60 or .70. Thus, it was decided to place 9 items in the final scale with component coefficients higher than .70.

The factor represented by variables v7, v9, v5, and v6 from the educational performance indicators scale under the first component coverage is *course material*. Items v1, v2, and v3 are *academician behavior*, and indicators v11 and v12 are *student behaviors*. The reliability analysis of the nine-item scale was performed in the final stage, and the Cronbach alpha coefficient was .961 for the entire scale. Reliability analyses performed for the sub-dimensional coverage gave an alpha coefficient of .849 for the first component, .852 for the second component, and .587 for the third component. It can be said that the reliability coefficient of the third component was rather low. Confirmatory factor analysis was used to temporarily confirm the three-component structure, which arose among all three types of participants in the study. SPSS program AMOS 21 (Arbuckle, 2006) was used for this purpose. First, the chi-square test values are examined to understand the compliance of the three-factor model that arose from the confirmatory factor analysis of the EPIE Scale and

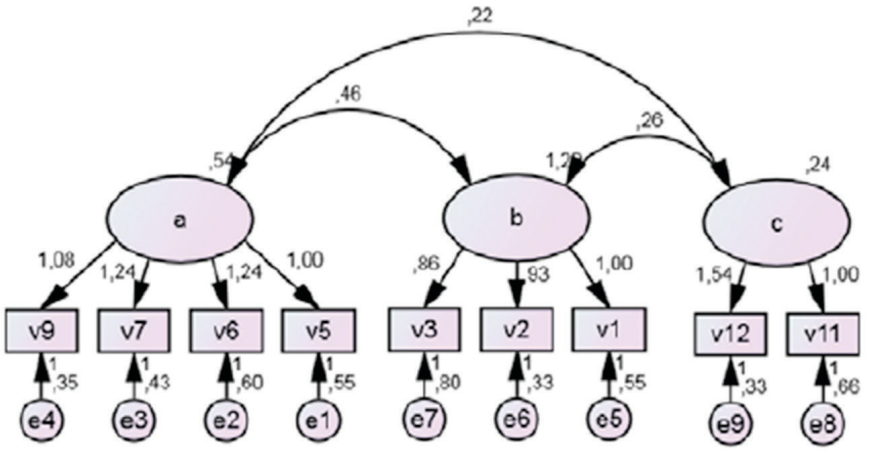

Figure 19: Three component EPIE indicators.

the data gathered from the field. If the sample size is sufficient in size, then a chi-square goodness-of-fit index value may be an important parameter to use in interpretation. The chi-square value of the study was 61.30 and the degree of freedom was 24 with a *p*-value of .000. The zero hypothesis for chi-square is determined to be the sample covariance matrix data obtained from the measurement data equal to the population covariance matrix data, and since *p* was less than .05, it was concluded that the data of the covariance matrices were different. Thus, it was concluded that the three-component model did not comply with the data. A significant non-compliance was present between the determined three-factor model and the observed covariance matrix (See Figure 19).

The researchers also regarded the results of other types of chi-square statistical analyses to assess the model and data compliance. One of these was the CMIN test in the AMOS program. The CMIN was found to be 61.0, sd of 24; p = 00; and CEMIN/DF: 2.55. It was also observed that the model did not comply under the CMIN calculation. Specialists have stated that a "good" compliance may be mentioned for a CEMIN/DF value of 1, an "acceptable" compliance for values between 1 and 2, and a "sometimes" compliance for values between 1 and 3 or 1 and 5 (Karplus, 2013). The RMSE Value, which is one of the most informative indexes of structural equality models, was found to be .10. This value also resembles a non-compliance, or "weak compliance."

Findings Related to the Hypothesis Tests

The hypothesis tests were calculated by taking the average scores from the (*a*) course material, (*b*) academician behavior, and (*c*) student behavior dimensions obtained after factor analysis. The first hypothesis was tested between the academicians and director groups. Thus, in the first instance, equal distribution of the values was examined using Levene's equality of variances test, and it was understood that the data met this prerequisite (F = 7.882; p = .006). *t*-test analysis was conducted for the first dimension of EPIE, which is *monitoring the use of course materials*, and it was understood that no statistically significant difference existed between the average grades of the academicians and the directors (t = .186, sd. 169; p = .853; MD: -.258; MDCI: -.300 - .248). The confidence interval range of the difference between the averages was found to be quite narrow. Non-existence of a statistically significant difference does not mean such a difference does not exist scientifically or in real life. The Levene test analysis made on *monitoring academician behaviors* proved that the variances of both groups are equal (F = 17.605; p = .000). *t*-test analysis is conducted for the item *monitoring the use of course materials*, and it was understood that no statistically significant difference exists between the average grades of the academicians and the directors (t = 1.245, sd: 169; p = .215; MD: -.217; MDCI: .562 - .127). The equality of the variances between the groups' test conducted for the final dimension *student behavior* provided negative results (F = .005; p = .945). Thus, the calculation values realized under the assumption of differing variances were considered. *t*-test analysis was conducted for *monitoring student behaviors* and it was understood that no statistically significant difference existed between the average grades of the academicians and the directors (t = 1.453, sd: 169; p = .148; MD: .178; MDCI: .420 - .063).

The second hypothesis was tested for the public and private universities. Comparisons were made between the average points of the three components, which are the sub-dimensions of the EPIE ipsative scale. For the first dimension, the equality of variance between the groups' test provided positive results (F = .425; p = .044). *t*-test analysis was conducted on *monitoring the use of course materials*, and it was understood that no statistically significant difference existed between the average grades of the public and private universities (t = .270, sd: 169; p = .787; MD: .037; MDCI: .312 - .237). The equality of the variances between the groups' tests gave negative results for the second dimension (F = .039; p = .844), and thus the calculation values realized under the assumption of differing variances were considered to apply. *T*-test analysis was conducted for the dimension *monitoring the behaviors of academicians* and it was understood that no statistically significant difference existed between the average grades of public and private universities (t = .114, sd: 169; p = .909; MD: .020; MDCI: .367 - .327). The equality of the variances between the groups' tests gave negative results for the third dimension (F = .714; p = .399), and thus the calculation values realized under the assumption of differing variances were considered applicable. *t*-test analysis was conducted for the dimension *monitoring the behaviors of students* and it was understood that no statistically significant difference existed between the average grades of the public and private universities (t = .028, sd: 169; p = .977; MD: .003; MDCI: .246 - .239).

The third hypothesis was mentioned as "no difference between the self-assessment scores and the average score of the EPIE components." The purpose of this hypothesis is to detect if the EPIE is affected by objective factors, such as director or academician, private university or public university, or by psychological factors such as personality and self-assessment. Equality of variance between the groups' tests was checked and it was seen that the groups had the same variance (F = .983; p = .000). According to single-direction variance analysis results, it was understood that the average points showing the dimension *monitoring the use of course materials* might differ according to the type of self-assessment. A statistically significant difference existed between the self-assessment points and the average points of the EPIE components (F = 11.681; sd: 4; p = .000). Also, a statistically significant relation was detected between the self-assessment points and the dimension *monitoring the behaviors of the academician*. Equality of variance between the group's test was F = 5.522; p = .000 whereas the variance analysis values were F = 6.966; sd: 4; p = .000. The Levene test was performed as a prerequisite for self-assessment points and the dimension *monitoring student behaviors*, and obtained the results F = .347 and p = .846. The single direction variance analysis test result was not considered for this group since the group variances were not equal.

Discussion

Priority was given to the hypothesis tests while evaluating the findings. A significant relationship could not be established between the point averages of the EPIE components of the director-academician and private university-public university groups, which may be assumed as "objective phenomenon." The differences between the groups in relation to the levels of *monitoring the performance* indicators did not provide statistically significant results. However, one may also not claim that any significant difference exists scientifically or in real life. Score averages tend to deviate from reality in Likert-type scales as well as in ipsative scales. Low points may be leveled with high points and a significant relationship cannot be established in the case of middle-degree intensification. The sample size of 171 individuals might have been insufficient. However, a statistically significant relationship was additionally detected between the self-assessments of the participants, which may be deemed as a psychological phenomenon, and the score averages of two of the EPIE components. These two components are the dimensions *monitoring the use of course materials* and *monitoring the behaviors of the academician*. The group variances were not equal for the third component, and the results of the variance analysis were accordingly not taken into consideration. It was understood that the participants deemed themselves mostly as persons with attitudes of "permitting freedom" and "being easy going," and this affected the scores more than the EPIE components. This proves that the attitudes and approaches of people while establishing the educational performance indicators affected their self-designations and self-assessment moods rather than their official positions. Explanatory factor analysis was used to examine the factorial infrastructure of the 12 theoretical EPIE, and a three-component structure was obtained. "Insufficiency of analysis" was the second of three components with only two indicators. If the sample size was increased or the number of indicators were higher, the number of items in the third component might increase. This study did not aim to develop an attitude scale. The aim was to establish a lesser but more effective number of educational performance indicators to serve as an improvement of educational quality by means of academicians and directors. The more academicians and directors assess higher points for the necessity of monitoring an indicator, the more probable it will be that such an indicator will be taken under the monitoring plan and become more effective. As a beginning, this study shows nine indicators that may be used for monitoring educational performance with academicians taking a role in the education process. After the establishment of the factorial structure, confirmatory factor analysis was performed in the frame of the structural equality model to see to what extent the three-component model that arose complied with the gathered data. This analysis has a temporary quality. In fact, examining the three-component model with data from another sample drawn from the same population would provide more substantial results. Such a study would be the factual examination of the theoretical information. The model-data compliance could not be seen from the confirmatory factor analysis for which the chi-square tests and other compliance tests were conducted. Perhaps more advanced analyses are required which consider the independence or dependence of the error factors. Some authors prefer large sample sizes and others small volume samples for compliance. However, the appropriate representation of the measurement universe by the determined indicators is as important as the size of the sample. Thus, it would be favorable to perform focus group research on the 12 indicators of the EOIE index.

Cabrera et al. (2001) stated that educational performance during university education is a mutual result of previously existing student characteristics as well as the education provided by the university during this time. They expressed that student characteristics prior to attending a university include talents, social-economic status or background, educational expectations, ethnicity, and gender factors. Indicators during university education include in-class and out-of-class activities. In-class activities were examined under the variables of teaching and lecturing methods, curriculum, relationships between students, and relationships with faculty members. Out-of-class activities were approached as social activities and student club activities. In this research on educational performance, indicators were evaluated only within the framework of the classroom. In the survey form from Cabrera et al., they came up with 5 factors from 26 experiences that specifically were aimed at measuring in-class experiences, and they found that these five factors demonstrated 62% of the total variance. Three out of the five factors were related to training activities and the other two were related to class environment, which included tolerance toward women and minorities. In their study, three in-class factors that could be related are as follows: (*a*) interaction and feedback in the classroom environment, (*b*) cooperative learning, and (*c*) teacher's subject knowledge and careful organization of the subject. These variables are indirectly related to the variables used in our study, such as course material, course plan, and interactive teaching. It is seen that Cabrera et al. dealt with and evaluated educational performance indicators not only in-class but also in a wider framework. In various studies, educational performance indicators were studied at national, institutional, and campus levels, and reports were produced (Chalmers, 2008). Indicators at the departmental levels were classified under the subtitles of input, process, and results indicators. Indicators discussed in this research were focused on process and results. Because of this, results obtained from this research cannot be compared with other research at similar levels. Furthermore, in many research studies, performance indicators were associated with "program outputs." Providing program output is seen as having equal value as to the substantiation of performance indicators (Felder, 2003). This means that specific educational indicators directed at programs rather than general educational indicators came into prominence. Performance indicators in this research were discussed from the perspectives of "class pedagogy" and "education standards." There are researchers like Kozma (2014), who have directed their attention to this subject in the literature. However, there is still no consensus among researchers about which basic indicators must constitute educational indicators.

Our final assessment relates to the distribution variance of the three-component and nine-indicator EPIE index with regard to the academicians and directors group and the public university and private university group. If general evaluation were the case, it could be said that the score distribution of directors resembles the scores of the private universities, and the scores of the academicians resemble the scores of the public universities. Most of the academicians expect the implementation of educational performance indicators at a a minimal level, whereas directors and private universities provided opinions between the 2 and 3 point intervals in support of monitoring practices. However, one is aware that quality directors of universities expect EPIE monitoring levels to be much higher, perhaps at the 3 to 4 point level. As EPIE monitoring expectations relate to personal self-assessment more than the managerial position of the person, it seems that any work on creating self-awareness, informing, and providing sensibility would be effective in raising the EPIE monitoring levels to higher scores.

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