

Strategy Research and Education in the Critical Sector of Tourism - Comparative Assessment at International and Greek Level

Varelas S and Georgopoulos N*

Department of Business Administration, University of Piraeus, M. Karaoli & A. Dimitriou 80, Piraeus, Greece

*Corresponding author: Georgopoulos N, Department of Business Administration, University of Piraeus, M. Karaoli & A. Dimitriou 80, Piraeus, Greece, Tel: 6946748010; E-mail: sotirisvarelas@gmail.com

Received date: July 25, 2017; Accepted date: August 03, 2017; Published date: August 14, 2017

Copyright: © 2017 Varelas S, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

The scope of this paper is to analyse and record the theoretical background of strategic management in the tourism industry and businesses, from the standpoint of education. The objective of this study is to present research on strategic management in the critical sector of tourism and hospitality businesses in particular. Through a review of the surveys carried out so far, we seek to analyse the research concern about education in tourism, as well as the contribution of strategic management. In the context of this work, we present tourism education and its development at international level, with special emphasis on the Greek education system. The same comparative assessment, both at international and Greek level, is made separately for the discipline of strategy as distinct aspect of business administration. Lastly, for the purposes of the research, a field study was carried out among Greek hotel businesses, reflecting the emphasis placed by business executives on education and their insights into strategic management theories.

Keywords: Tourism; Business administration; Economic; Hospitality Management

Introduction

Tourism education internationally

The internationalization of tourism business activity requires modern universities and research to shift from a purely national action plan towards a larger multinational one.

The development of tourism education worldwide began in the 1960s and 1970s and included, mainly, programmes of vocational training and tourism employee's skills' development [1]. It was in the 1980s and 1990s that education developed and reached university level. Even then, education programmes placed emphasis primarily on the development of business analysis, assessment and administration skills [2]. According to Stuart [3] the people responsible for curriculum design focused mainly on broader theoretical issues rather than on the needs of the tourism industry. Tourism-related research and education knowledge is provided by programmes combining European and internationalist knowledge, always targeting the possibility of finding a job in an enlarged global economy [4,5].

Tourism, as business activity, consists of a collection of interconnected activities, which makes its placement into only one field of study difficult [6]. Several academics and researchers argue that tourism, as a multidisciplinary study field, constitutes a distinct cognitive field. This point reflects the views of numerous scientific stakeholders involved in the tourism industry [6]. Meanwhile, the majority of education programmes consider tourism in terms of business administration.

The majority of curricula worldwide, as well as all research activities, is divided into the 3 following categories:

- Tourism Management
- Hospitality Management
- Hospitality and Tourism Management.

Many of these programmers use the term "Tourism", whereas some others prefer the term "Travel" [7]. According to Goeldner [8], university tourism education and research is 50 years behind the respective Business Administration programmes, thus resulting in a very broad field of research in this sector and the Strategic Management in Tourism and Tourism Businesses in particular.

Tourism Education in Greece

Up until mid-1980s, tourism education was limited to the level of secondary education. The only exception was the School of Tourism Professions (ASTER) in Rhodes Island. There is a wide range of trainings fragmented across 3 different Ministries and 15 different training bodies. 1983 marks the creation of seven Technological Educational Institutes, of similarly theoretical nature and detached from the market demands. When it comes to public University education, 3 postgraduate studies programmes (Master's) were created in late 1990s and continue until today.

- University of Piraeus - Master in Business Administration - Tourism Management
- University of the Aegean - Master in Tourism Planning, Management and Policy
- Hellenic Open University - Master in Tourism Business Administration.

Greece, although being an essentially tourism country, has not managed to create a University education programmer yet. According to Logo Thetis, the heads of tourism businesses have always shared the view that tourism in Greece needs low- and medium-level schools, rather than University Education.

The first University departments of Tourism Studies were founded in 2009, at the University of Piraeus and the University of the Aegean, by virtue of the Presidential Decree no 77/2009 (Greek Official Gazette, 95/22-6-2006). Nevertheless, due to the financial crisis that started in Greece in 2010, the two departments were abolished and integrated, in the form of courses, in the Business Administration departments of the forenamed Universities. More recently, in 2014, a Joint Ministerial Decision of the Ministers for Education and Tourism provided for the creation of the first Tourism University Programs for foreign students taught in English. This decision however was annulled in 2015 by the new Minister for Education. Recently, the adoption of Article 26 of L. 4452, Issue A1, on 15 February 2017, led to the reestablishment of the Department of Tourism Studies at the University of Piraeus and the Department of Tourism Economics and Management at the University of the Aegean so that they would open for the first time in Greece in the period 2017-2018.

When it comes to tourism research, things are better. The first Center of Tourism Studies started its national operation in 1956, at today's University of Piraeus, whereas the University Center of Tourism Studies and Education opened in 1994 [9]. The first research papers were presented in 1929. It was the first time that reference was made to the discipline of tourism by Nikolaos Eginitis, followed by Manou [10]. In 1955, the scientific journal SPOUDAI, Issue no 6, published the results of the scientific review of tourism activities at the time. In 1955, Papadopoulos [11] published his work entitled "Impact of tourism expenditure on the main economic parameters". In 1967, Logothetis published his work entitled "Problems and direction of tourism policy". Numerous scientific-economic magazines were published during the 1970s, focusing on tourism and economy. When it comes to literature, there are many references by Kalfiotis who was the first, along with Sorviane, to mention the term 'tourism marketing' [12]. By the end of the 1970s, we come across approximately 10 scientific works on tourism businesses, the macroeconomic review of tourism, tourism geography, the role of tourism in the Greek economy.

The Center of Planning and Economic Research also carried out substantial studies on tourism policy. More specific sectoral research and literature references came up in 1980. The following authors stood out at the time: Lytras [13-15] with works about tourism development, tourism psychology, tourism sociology, Antonia [16] addressing issues related to tourism legislation and Drosopoulou [17] focusing on agrotourism. In 1989, Petreas [18] completed his work entitled "Tourism Marketing" providing a modern, integrated approach to tourism marketing, that was followed by the books "Tourism Policy", "Tourism Economy", "Tourism Marketing" of Igoumenakis [19-21] and the book "Professional Tourism - Organisation of Conferences in hotels" of Kostas Krakavitis [22]. The work of Chitiris [23] was the first integrated approach to travel agencies. As of 2000 and onwards, literature about this critical sector in Greece developed considerably, with important works [24-40]. A total of 800 research works has been carried out in Greece, including both dissertations and doctoral theses.

Strategy in Tourism: Review of Research and Education in Greece

Academic journals and papers are the main means of dissemination of research findings about strategic management and its applications in modern businesses. There are various general scientific journals focusing on strategic management: "Strategic Management Journal", "Long Range Planning" and "Academy of Management Review". When it comes to the administration aspect of the tourism and hospitality

industry, there are specific scientific journals, focusing mainly on strategy as part of marketing, management and other sectors. Strategy approaches are included in the following tourism and hospitality magazines, as listed in the work of Itchie and Goeldner [41] "Annals of Tourism Research", "The Cornell Hotel and Restaurant Administration Quarterly", "Hospitality and Tourism Education", "Hospitality Research Journal", "Hotel and Motel Management", "The Hotel Valuation Journal", "International Journal of Hospitality Management", "Journal of Hospitality and Leisure Marketing", "Journal of Leisure Research", "Journal of Travel and Tourism Marketing".

Strategic research began in early 1980s on the basis of the tourism and hospitality strategy literature. The background of these studies was of a more conceptual nature and was mainly related to strategic planning rather than strategic management [42]. Towards late 1980s, experiential work becomes more explicit, focusing primarily on the examination of the environment and the "harmonisation" of the strategy with the organizations structure [43,44].

The same finding came up from the Greek review of literature and research. Strategy in general and, in many cases, strategic management, is part of a larger cognitive field related to marketing and not a distinct component of Business Administration. Important works in Greece include "Strategic Management" by Professor Georgopoulos as well as the work of Papadakis entitled "Business Strategies". When it comes to research and education, the University of Piraeus and the Master's Programme on Business Administration - Tourism Management, by Professor Georgopoulos, propose a distinct approach to strategic management in tourism. Several dissertations have been carried out in the same university addressing the issue of strategic management in tourism, while there is an ongoing PhD thesis on the same topic. When it comes to essays, a first distinct presentation of strategy is provided by Andriotis [45] in "Tourism Business Management - A Strategic Approach". According to the files from the Greek National Archive of PhD Theses, only 3 PhD theses in Greece focus purely on strategy in tourism and tourism businesses, including the PhD thesis of the participant in the present research [46]. Respectively, when it comes to master's studies, according to a survey carried out by the Greek National Documentation Center, at least 80 research dissertations on tourism strategy have been carried out.

Exploring the Strategy-related Education Level in Greek Tourism Businesses

Having completed the overview of the research and education reality of tourism strategy, we seek to explore the current situation of hotel businesses in Greece, as well as how the education level contributes to the business' value chain.

It is a fact that educated and skilled staff is part of the intangible assets of the business and its value chain, with a view to obtaining competitive edge over its competitors [47-49]. It is through education that organizations can obtain and accumulate organizational knowledge [50-52]. Businesses in general and, not only those involved in tourism, have a sceptical stance towards trained and educated staff. In particular, when it comes to tourism businesses, special emphasis is placed on unskilled workers and low-and middle-level executives. Businesses consider education to be a variable cost rather than an investment that will generate value and improve their performance [53].

In this framework and further to the previous analysis about education on tourism as well as the strategy as distinct component of

business administration, this section provides an overview of the education level of tourism professionals. The field study includes hotel business managers at Peloponnese, one of the 13 Regions of Greece.

The results presented in this paper are part of a larger survey regarding the way in which strategic management is used by tourism businesses. For the purpose of the research, a primary survey was carried out in order to present the education background of hotel executives and correlate it with the parameters affecting the performance of their businesses. For the analysis of the data that helped us draw the conclusions of the research, we used statistical methods such as field study of hotel businesses at Peloponnese, Descriptive Statistics and Factor Analysis Technique in order to identify the role of competition as separate parameter affecting the performance of hotel businesses. Further correlation of competition with the characteristics of hotel businesses followed.

Descriptive Statistics for Data Analysis

The survey was carried out among hotel businesses at Peloponnese and included all hotel categories (1 up to 5 stars). 131 hotel business executives were surveyed: men accounted for 69.5% of all participants and women for 30.5%. One out of two people surveyed were the owners of the hotel, whereas the rest of them were holding senior management positions (Table 1). When it comes to strategy-related knowledge used as a tool for business administration, 73.1% of participants in the field study ranked the extent of application of strategy in the hotel as 'Some' up to 'A lot'. In the question "which tool(s) is (are) used when planning the business strategy" 42% said that no tool(s) is (are) used, 40.5% use SWOT Analysis, 19.1% use PEST Analysis and 9.9% use the Porter's five forces analysis.

Gender	Male	91 (69.5%)
	Female	40 (30.5%)
Position in the Business	Owner	72 (55.0%)
	General Manager - Manager	29 (22.1%)
	Reservations Manager	17 (13.0%)
	Sales - Marketing Manager	7 (5.3%)
	PR Manager	4 (3.1%)
	Other	2 (1.5%)
	PhD	5 (3.8%)
Education Level	Master	36 (27.5%)
	Higher/Technological Education Institute Degree	46 (35.1%)
	Bachelor	11 (8.4%)
	Vocational School Graduate	16 (12.2%)
	Lyceum Graduate	15 (11.5%)
	Other	2 (1.5%)

Table 1: Participants' characteristics.

	SWOT	PEST	PORTER	Ansoff	7-Ss McKinsy	BCG	BSC	None	Other
Frequency Rate (%)	53 (40.5%)	25 (19.1%)	13 (9.9%)	0 (0%)	1 (0.8%)	1 (0.8%)	4 (3.1%)	55 (42%)	2 (1.5%)

Table 2: Knowledge of main strategic management tools.

The tourism businesses surveyed stated being familiar with collateral activities regarding strategy and strategic management. Although the application of business strategy ranked high in the assessment, we observed that not only the basic tools of portfolio analysis of business strategies were not assessed, but they were unknown.

This question deliberately included tools for macro-environment analysis, such as PEST Analysis (at small scale) and broader strategic decisions analysis, such as SWOT Analysis, which figured among the survey's results. What was clearly demonstrated was that there is lack

of basic strategy-related knowledge and tools among the senior executives and trained staff that were surveyed (Table 2).

Factor analysis of strategic management planning parameters and correlation with the executives' education level

In the context of the larger survey, we followed the Data Dimensionality Reduction factor analysis technique, converting multiple sets of variables, which refer to or explore the same phenomenon or characteristic, aiming at identifying the factors that

will interpret a significant percentage of correlation of the variables' group according to the survey's results.

At first, we identified common factors among a group of primary variables and presented the expanded sets of variables that we wished to reduce including the common characteristics. For the purpose of this survey, we correlated the factors that emerged with the participants' education level.

The following factors emerged and were explored in the context of the survey, depending on the education level of the participants:

The factors/variables are the following:

- Determination of strategies on the basis of the market and the clients,
- Determination of strategies on the basis of internal and external environment,
- Determination of strategies on the basis of competition,
- Performance increase indicator for the use of Strategic Management,
- Indicator of the positive impact of strategy on the business financial performance,
- Measurement of Business Efficiency.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Efficiency measurement								
PhD	4	23	3.559	1.78	17.34	28.66	20	27
Master	33	23.48	4.192	0.73	22	24.97	12	30
Higher/Technological Education Institute Degree	44	21.41	4.905	0.739	19.92	22.9	8	30
Bachelor	10	19.2	7.345	2.323	13.95	24.45	6	30
Vocational School Graduate	13	14.77	5.932	1.645	11.18	18.35	6	23
Lyceum Graduate	11	11.64	6.297	1.899	7.41	15.87	6	22
Total	115	20.18	6.346	0.592	19.01	21.35	6	30
Determination of strategies on the basis of the market and the clients								
PhD	4	45.25	7.042	3.521	34.05	56.45	35	51
Master	32	39.03	7.925	1.401	36.17	41.89	14	54
Higher/Technological Education Institute Degree	44	37.86	7.46	1.125	35.6	40.13	22	53
Bachelor	10	34.3	12.148	3.841	25.61	42.99	11	51
Vocational School Graduate	13	29.69	9.437	2.617	23.99	35.4	11	41
Lyceum Graduate	12	21.83	11.731	3.386	14.38	29.29	11	50
Total	115	35.54	10.31	0.961	33.63	37.44	11	54
Determination of strategies on the basis of internal and external environment								
PhD	4	34.5	3.317	1.658	29.22	39.78	30	38
Master	34	30.91	4.92	0.844	29.2	32.63	20	38
Higher/Technological Education Institute Degree	44	29.16	5.044	0.76	27.63	30.69	17	37
Bachelor	10	27.6	7.662	2.423	22.12	33.08	13	38
Vocational School Graduate	13	25.38	4.84	1.342	22.46	28.31	16	32
Lyceum Graduate	14	23.07	9.102	2.433	17.82	28.33	11	36
Total	119	28.58	6.324	0.58	27.43	29.73	11	38
Determination of strategies on the basis of competition								
PhD	4	21.5	2.517	1.258	17.5	25.5	18	24

Master	34	20.44	3.116	0.534	19.35	21.53	13	25
Higher/Technological Education Institute Degree	43	19.56	3.312	0.505	18.54	20.58	13	25
Bachelor	10	18.9	4.408	1.394	15.75	22.05	7	22
Vocational School Graduate	13	19	3.674	1.019	16.78	21.22	13	24
Lyceum Graduate	14	16.21	3.62	0.967	14.12	18.3	10	22
Total	118	19.36	3.592	0.331	18.71	20.02	7	25
Use performance increase indicator								
PhD	4	49.5	7.188	3.594	38.06	60.94	39	55
Master	32	45.31	6.373	1.127	43.01	47.61	30	55
Higher/Technological Education Institute Degree	40	42.98	6.534	1.033	40.89	45.06	28	53
Bachelor	8	37.63	11.94	4.221	27.64	47.61	16	55
Vocational School Graduate	13	35.62	7.5	2.08	31.08	40.15	22	47
Lyceum Graduate	12	32.67	10.56	3.048	25.96	39.38	11	44
Total	109	41.5	8.763	0.839	39.83	43.16	11	55
Indicator of the positive impact of strategy on the business								
PhD	4	17.75	2.062	1.031	14.47	21.03	16	20
Master	32	15.59	3.191	0.564	14.44	16.74	10	20
Higher/Technological Education Institute Degree	44	14.55	2.799	0.422	13.69	15.4	9	19
Bachelor	10	14.9	4.408	1.394	11.75	18.05	7	20
Vocational School Graduate	12	13.75	2.491	0.719	12.17	15.33	10	17
Lyceum Graduate	12	11.58	3.343	0.965	9.46	13.71	4	16
Total	114	14.59	3.288	0.308	13.98	15.2	4	20

Table 3: Descriptive statistics of factors per education level.

Impact of the education level on the factors

The mean value and the standard deviation of each factor per education level is presented in Table 3, while Table 4 presents the Kruskal-Wallis test results; we can see that education level has a

statistically significant impact on all the factors. Combining the results shown in the tables, we conclude that the higher the level of education, the higher the score across all the factors and performance indicators concerned.

	Efficiency measurement	Determination of strategies on the basis of the market and the clients	Determination of strategies on the basis of internal and external environment	Determination of strategies on the basis of competition	Use performance increase indicator	Indicator of the positive impact of strategy on the business
Chi-Square	33.726	27.714	18.927	14.597	28.982	16.323
df	5	5	5	5	5	5
Asymp. Sig.	0.000	0.000	0.002	0.012	0.000	0.006
^a Kruskal Wallis Test ^b Grouping Variable: Education Level						

Table 4: Results from the comparison of factors per education level test statistics^{a,b}.

The research that preceded provides us with data on the role of education in the hotel businesses included in the paper's field study, whereas reference was made to the investigation of the role of strategy as well as strategy-related knowledge and tools in the organizations. The results indicate that the more educated the tourism business staff is, the more they have specific strategies and implement an administration approach based on the principles of strategic management. Research also shows that the increase of the participants' education level leads to increased tourism business performance and efficiency indicators. In essence, the research results confirm the tourism-related business theory. Therefore, the opinion - according to the literature - of tourism business managers that tourism does not need senior executives with tourism education background is erroneous and this is what prevented them from investing in the higher-level education of their staff.

Conclusion

The way in which strategy is perceived by the majority of the tourism businesses surveyed is something that will considerably increase or is already increasing their market share, revenues, reduces costs and improves their financial performance in general. When it comes to the efficient operation of the business, the quality of services provided, adaptability to change as well as the development of an innovation profile, high rates of response were observed among the research results. On the basis of previous research, it is easy to understand that the sector of Strategic Management, despite being a critical sector in tourism-related research due to its volatility, has not been covered enough by the current level of research and education. We believe that the development of considerable research on this critical sector of strategic management is equally important with the integration of strategic management in the curricula of the existing structures. What is more, businesses must invest in strategic management education in combination with tourism related educated executives. Tourism education will create the organisational knowledge that is required in order to obtain competitive edge over competitors.

References

1. Barrows WC, Bosselman RH (1998) Hospitality management education. The Haworth Hospitality Press. New York.
2. Cooper C, Shepherd R, Westlake J (1996) Educating the educators in tourism: A manual of tourism and hospitality education. World Tourism Organization. Madrid.
3. Stuart M (2002) Critical influences on tourism as a subject in UK higher education: Lecturer perspectives. *Journal of Hospitality, Leisure, Sport and Tourism Education* 1: 5-18.
4. Hjalager AM (2003) Global tourism careers? Dilemmas facing higher education in tourism. *Journal of Hospitality, Sport and Tourism Education* 2: 26-38.
5. Black K (2004) A review of the factors which contribute to the internationalization of a programme of study. *Journal of Hospitality, Leisure, Sport and Tourism Education* 3: 5-18.
6. Riegel C (1995) An introduction to career opportunities in hospitality and tourism. In a guide to college programs in hospitality and tourism. CHRIE J. Wiley. New York.
7. Jones P (2005) Finding the hospitality industry? Or finding hospitality schools of thoughts? *Journal of Hospitality, Leisure, Sport and Tourism Education* 3: 33-45.
8. Goeldner RC (1988) The evaluation of tourism as an industry and a discipline. Proceedings of the first international conference for tourism educators, University of Surrey. UK.
9. Kalafatis D (2009) Album - 70 years of university of Piraeus. Piraeus.
10. Manou D (1935) Tourism in Greece. Athens.
11. Papadopoulos L (1964) Impact of tourism expenditure on the main economic parameters. Athens.
12. Kalfiotis S (1978) Tourism marketing - basic principles. Tirovolas. Athens.
13. Lytras PN (1983) Tourism development, infrastructure, education and environment. Papazisis. Athens.
14. Lytras PN (1987) Tourism sociology. Interbooks. Athens.
15. Lytras PN (1988) Tourism psychology. Interbooks. Athens.
16. Efthimiadou A (1987) Elements of tourism legislation. Sakoulas. Athens.
17. Drosopoulou SA (1989) Agrotourist cooperatives. Interbooks. Athens.
18. Petreas Ch (1989) Tourism marketing. Galeos. Athens.
19. Igoumenakis N (1990) Tourism policy. Interbooks. Athens.
20. Igoumenakis N (1991) Tourism economy. Interbooks. Athens.
21. Igoumenakis N (1991) Tourism marketing. Interbooks. Athens.
22. Krakavitis K (1992) Professional tourism-Organization of conferences in hotels. Interbooks. Athens.
23. Chitiris L (1995) Travel agencies. Interbooks. Athens.
24. Kokkosis Ch, Tsartas P (2001) Sustainable tourism growth and environment. Kritiki.
25. Laloumis D (2002) Hotel administration. Stamoulis.
26. Zacharitou G (2003) Package tour. Propompos.
27. Mpenetatos D (2004) Marketing management for services and tourism. Stamoulis.
28. Andriotis K (2004) Tourism business management: A strategic approach. Stamoulis.
29. Efstathiou P (2004) Recreation and tourism. Papazisis.
30. Milonopoulos P (2005) Marine tourism. Interbooks.
31. Lagos D (2005) Tourism economics. Stamoulis.
32. Venetzopoulou M (2006) State contribution to tourism. Interbooks.
33. Komilis P (2007) Sustainable perspective of tourism development. Propompos.
34. Sotiriadis M (2005) Financial management in hotel businesses. Propompos.
35. Katsoni V (2006) Total quality management: Application in tourism. Stamoulis.
36. Igoumenakis N (2007) Tourism economy. Athens: Interbooks.
37. Chatziniolaou E (2008) Tourism business legislation. Athens: Propompos.
38. Avgerinou (2011) Economic context and planning of tourism. Propompos.
39. Dionysopoulou P (2012) European tourism policy. Papazisis.
40. Protopadakis I (2013) Services marketing: Application in tourism. Stamoulis.
41. Ritchie B, Goeldner C (1994) Travel, tourism and hospitality research: A handbook for managers and researchers. John Wiley & Sons.
42. Olsen MD, Roper A (1998) Research in strategic management in the hospitality industry. *Hospitality Management* 17: 111-124.
43. Schaffer JD (1987) Competitive strategies in the lodging industry. *International Journal of Hospitality Management* 6: 33-42.
44. Tse E, Olsen M (1998) Strategic management. The handbook of contemporary hospitality management research. John Wiley & Sons Ltd. Chichester.
45. Andriotis K (2004) Tourism business management: A strategic approach. Stamoulis.
46. Varelas S (2016) Tourism enterprises development strategies: the case of hotel enterprises. Dissertation. University of Piraeus.
47. Barney JB, Wright PM (1998) On becoming a strategic partner: The role of human resources in gaining competitive advantage. *Human Resource Management* 37: 31-46.

-
48. Kamoche K (1996) Strategic HRM within a resource - Capability view of the firm. *Journal of Management Studies* 33: 213-33.
 49. Barney J (1992) Integrating organizational behavior and strategy formulation research: A resource-based analysis. *Strategic Management* 8: 39-61.
 50. Lee CC, Yang J (2000) Knowledge value chain. *Journal of Management Development* 19: 783-93.
 51. Bolinger AS, Smith RD (2001) Managing organizational knowledge as a strategic asset. *Journal of Knowledge Management* 5: 8-18.
 52. Aragón-Sánchez A, Barba J, Sauz R (2003) Effects of training on business results. *International Journal of Human Resource Management* 14: 956-80.
 53. Komilis P (1986) *Scientific research - Spatial analysis of tourism*. Athens: Center of Planning and Economic Research (KEPE).