

# ANALYSIS OF THE SIGNALING HYPOTHESIS IN HIGHER EDUCATION MARKETING VIA CLASSROOM EXPERIMENT

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**Abstract:** *In the international literature of information asymmetry research on the field of marketing has been published since the 1970s. Several authors revealed the signal function of the quantity and specificity of the information in the marketing communication activities mainly in case of experience goods, i.e. sellers of better quality products and services communicate a higher quantity of and more specific pieces of information voluntarily because this causes less risk for them than for their weaker competitors. If this practice is well-known by the customers and for this reason they trust in the products and services about which they possess more and/or more accurate pieces of information, then this business behaviour pays off for the firm with higher quality products in the higher prices and repurchases and becomes permanent. On the other hand, for the firms with lower quality products the behaviour of publishing no, less or less specific pieces of information becomes the norm. This paper examines this phenomenon in the market of higher education institutions. Our research questions therefore are the following: How does the quantity and quality of the information published by the higher education institutions affect customers' evaluation on them? Is there any difference in this effect according to how much the published information is connected to the usual educational quality measures? To answer these questions we used quantitative classroom experiment method with 101 higher education students. The results of this experiment confirmed our hypotheses that the better universities and colleges gain competitive advantage by publishing more and highly specific information about themselves. Especially the information that is related strongly to the academic quality measures is important. In contrast, more informative behaviour contributes to the competitive disadvantage for the lower quality institutions. Our findings aim to contribute to the better understanding of the informational behaviour of higher education institutions. These results can also be useful for those responsible for the marketing communication of such organisations and for those who base their decisions on this communication.*

**Keywords:** signaling; information asymmetry; higher education marketing

**JEL classification:** D82; I24; M37

## **1. Introduction**

The current study examines the role of signaling in the field of higher education marketing. Actuality of this topic stems from the sharpening global competition among the higher education institutions for students that increases the importance of advertisements, public relations (PR) and other marketing communications tools. Literature of the information asymmetry has revealed the relationship between the quality of products and services and the marketing communication strategies already in the 1970s.

Our research intends to verify the validity of these general theories specifically for the higher education services via experimental method. Due to the limits of this paper we

focus only on a narrow area of this broad topic: the effect of the information published in higher education advertisements on the presumed quality by the customers. With its findings, this paper aims to contribute to the better understanding of the informational behaviour of higher education institutions. These results can also be useful for those responsible for the marketing communication of such organisations and for those who base their decisions on this communication, such as prospective students.

Our research questions were the following:

Q1. *What is the effect of the specificity of the information published by the higher education institutions on their evaluation by the customers (current and prospective students)?*

Q2. *Is there a difference in this effect according to how strongly the information is connected to the measures of academic quality?*

Our hypotheses, based on these research questions, were the following:

H1: *Publishing more specific information about themselves provides a competitive advantage for those higher education institutions that are characterised by higher academic quality.*

H2: *For the lower quality higher education institutions, however, publishing more specific information about themselves leads to a competitive disadvantage.*

H3: *The importance of the published information for the customers also matters: if the information is more important to them, it strengthens the previous effects for both the higher and the lower quality institutions (i.e. the customers are able to judge the institutions more precisely), and if it is less important, it weakens those effects.*

After reviewing the relevant literature in the next chapter of this paper, chapter 3 describes the collected data and the methodology of the empirics. In chapter 4 we present our findings and answer the research questions. In the last chapter we summarise the results with its limits and some future research directions.

## **2. Literature Review**

The relationship between information asymmetry and marketing are took a significant part in the economics discussion from the mid-1970s. In his publication that is sometimes referred to as the first one in this field Nelson (1974) established a theoretical model to analyse the informational role of advertisements in the case of both search goods, where information on product quality is free or cheap for the prospective buyer before purchase, and experience goods, where pre-purchase quality information is unavailable or costly. For experience goods advertising is not able to provide specific and reliable information, or if it is, only with serious constraints. However it can communicate the quality of the brand. Those brands that turns out to be good during consumption will then be repurchased even if advertising costs are increasing the price of the product. For worse brands the first purchase is not followed by a repurchase. Consequently, sellers of better brands can, whilst sellers of worse brands cannot afford the advertisement costs. Advertisement under these circumstances serves as a signal (Spence, 1973).

Based on Nelson's model the signaling function of advertising costs was also analysed by Milgrom and Roberts (1986). They put their focus of inspection on the dissipative advertising that not urges directly on buying. They found that if goods are purchased repetitively, even high introductory price and strictly monotonously increasing dissipative marketing expenditures can act as signals. Later Hertzendorf (1993) refined the previous results. He found that advertising bore informational role only when prices and quality were not correlated. Hertzendorf and Overgaard (2001) also examined the role of the signaling hypothesis behind the dissipative advertising but this time for oligopolies. They found support for the hypothesis and in addition they drew the conclusion that quantity of advertisement was depending not only on brand quality but also on the quality difference

compared to the competitors.

In public relations, a sub-area of marketing, Teoh and Hwang (1991) introduced the signaling hypothesis as a reason behind firms' information disclosure or information nondisclosure behaviour. They concluded that stronger companies sometimes implemented signaling strategy via adverse disclosure (releasing bad news and withholding good news). This strategy is harmful for the company on the short run, thus weaker companies cannot follow it, because they would not survive the negative consequences on the short run, thus the stronger ones can signal their strength through they can cope with the same negative effects easier. The weakest companies will deliver no information at all to the market. They will communicate neither the bad news because of the market sanctions, nor the good ones because of the costs that will not be paid back hence their products will not be repurchased. Or simply they do have no good news.

In the market of IT products Afzal, Roland and Al-Squri (2008) conducted an experimental research to examine the effect of information asymmetry on the product evaluation in case of laptop computers (that are somewhere between search and experimental goods for those customers who are not IT experts). They found that the availability of information impacted the product judgements as it has probably reduced the uncertainty and may have provided more relevant cues to subjects.

Higher education provides experience goods (see among others Melton and Trevino, 2001, Dill and Soo, 2004, Hodge, 2006). Brand is the name of the university or college and the products are their programmes. Based on the literature review we drew the conclusion that higher education institutions with high academic quality will be significantly more transparent, while lower quality ones will provide much less or no information about themselves.

### 3. Data and Methodology

The classroom experiment were conducted between 7<sup>th</sup> and 10<sup>th</sup> April, 2014 at Faculty of Economics and Business Administration, University of Debrecen (UD FEBA), Hungary. Our sample consisted of students from three educational levels (higher vocational education, bachelor, and master) and 5 majors (Business Administration and Management at ISCED level 5 (BAM), International Business at ISCED level 5 (IB), BA in Business Administration and Management (BA in BAM), BA in International Economy and Business (BA in IEB), and MSc in Management and Leadership (MSc in ML) totalling 101 observation units (students) distributed as indicated in Table 1.

**Table 1:** Sample distribution

Educational level	Major	Sex		Total
		female	male	
Higher vocational education	BAM	5	1	6
	IB	1	3	4
	Total	6	4	10
Bachelor	BA in BAM	19	12	31
	BA in IEB	27	14	41
	Total	46	26	72
Master	MSc in ML	12	7	19
Total		64	37	101

In the experiment students were asked to review 12 fake advertisements of U.S. higher education institutions and categorise them as top or average quality institutions and rank them in order of academic quality as well. The fake advertisements were composed by

the authors but contained only real data available on a free access online ranking site (<http://colleges.findthebest.com>) totalling 1,028 U.S. located universities and university colleges (all of them provided master programmes). 6 of the 12 institutions are on the top of the above mentioned U.S. ranking (Harvard University #1, Yale University #2, Princeton University #3, Massachusetts Institute of Technology #4, Columbia University in the City of New York #5, Stanford University #6). The remaining 6 institutions are significantly lower ranked, however, not at the bottom of the ranking as the institutions at the end of the ranking do provide no or not all of the information the experiment needed (the lack of information at the bottom of the ranking list reflects the message of the signaling literature, see for example Teoh and Hwang, 1991). Therefore, we used the lowest ranked institutions with all the required information (Ramapo College of New Jersey #731, Coppin State University #733, Chicago State University #736, Western Oregon University #737, Portland State University #738, Mount Mary College #774). All students in the experiment worked with the same 12 institutions but to eliminate the influence of image, name, and order, we renamed the institutions as 'A institution', 'B institution' etc. and created 24 different permutations.

Each of the advertisements included 15 pieces of information (items). 8 of them – referred to as important ones – are strongly connected to academic quality (institution type – university or college; acceptance rate; average Scholastic Aptitude Test score; out-of-state tuition; full-time drop-out rate; faculty-student ratio; 4-year graduation rate; number of prominent graduates such as U.S. presidents, vice-presidents, Nobel and Pulitzer prize winners and justices). 7 of them – named as unimportant ones – are no or loosely connected to academic quality (year of foundation, size of settlement, expenses on campus room and board, expenses on books and supplies, financial aid percent, total enrolled students, women to men ratio).

In the experiment the 12 higher education advertisements were provided to the students in a form of 2 different booklets ('X' and 'Y' type booklets). Booklet X was used in the first phase of the experiment while booklet Y in the second phase. For both the top 6 and average 6 institutions booklet X contained 2 advertisements with all the 15 pieces of information being specific; 2 with no specific information at all; 1 with 8 specific important and 7 non-specific unimportant information; 1 with 8 specific unimportant and 7 non-specific important information. In booklet Y every item for every institution was specific. In case of numerical advertisement items we used accurate data in the specific and much less accurate data in the non-specific cases. In case of the single item of institution type we used the term university or college in the specific and higher education institution in the non-specific version.

In the first phase (consisting of 2 turns) of the experiment students were provided booklet X and first were asked to classify the 12 institutions as top or average ones. After this turn answers were collected and in the second turn (in the same phase) participants were asked to rank the same institutions according to a descending order of putative quality. At the end of this phase both the student rankings and the booklets X were collected. In the second phase students were given booklet Y and they had to classify and then also to rank the institutions again (coded names and the sequence of the institutions in the two booklets were independent from each other).

To ensure the interest of the participating students in the experiment they were offered some extra points to their semester grade: every student got 2 percentage points for the participation, the student with the best overall result (most realistic classifications and rankings) got 10 percentage points, while the second and third one got 5-5 percentage points.

#### 4. Results

After reviewing the literature we can conclude that the top higher education institutions should publish a greater quantity of more specific information than their average counterparts. The reason behind this is the impact of the information on the competitive advantage. The transparency serves as a signal itself: customers know that more transparent institutions tend to be better in academic terms.

To examine our hypotheses, paired sample *t*-tests were used. First we compared the students' evaluation of the institutions (classifying them as top or average quality institution and ranking them in descending quality order) in the first (based on the less specific booklet X) vs. in the second phase (based on the fully specific booklet Y). We found that the students classified the institutions more precisely (top as top, average as average), and gave them lower (better) ranks for the top and higher (worse) ranks for the average institutions more likely in the second phase (when they knew all of the information). The above mentioned results are all significant and confirm H1 and H2 hypotheses: publishing more specific information about themselves provides higher quality institutions a competitive advantage as they are judged better when more specific information is present than when only less specific information is available, while the same situation provides a disadvantage for the average quality institutions as they are judged worse when more specific information is known than when only less specific information is available.

Since the directions of the informational impact on top and average institutions are different, there is no significant effect on the total sample of institutions in case of classification. Statistical data are shown in Table 2. Difference in ranking of all of the institutions is trivially impossible, thus it was not analysed.

**Table 2:** Comparing the results of both classification and order ranking assignments by the true quality of the institutions and the booklet type (*N* = 101)

Test variable	Booklet	Mean	Std. dev.	<i>t</i>
Number of top institutions classified correctly	X	5.3762	1.1212	-4.4955***
	Y	5.7822	0.7824	
Number of average institutions classified correctly	X	0.8416	1.1201	5.4365***
	Y	0.2673	0.8111	
Number of all the institutions classified correctly	X	6.2178	1.2133	1.5306
	Y	6.0495	0.7399	
Average ranking of top institutions	X	3.7277	0.5481	3.7034***
	Y	3.5066	0.2272	
Average ranking of average institutions	X	9.2723	0.5481	-3.6143***
	Y	9.4785	0.1694	

Note: Std. dev. = standard deviation, *t* = value of the Student *t* statistic; \*\*\* = significant at level 0.01.

If the advertisement of a top institution was totally specific, then the students have classified it as a top one significantly more likely than if it was not specific at all. An average institution tended to be (incorrectly) classified as a better one more likely if its

advertisement was not specific at all. In case of the top institutions the advertisements including only specific information got significantly lower (better) ranks on average than those with no specific information. Table 3 presents the statistical data.

**Table 3:** Comparing the results of both classification and order ranking assignments by the true quality of the institutions in cases when all the items are specific and when no item is specific ( $N = 101$ )

Test variable	Specific items	Mean	Std. dev.	<i>t</i>
Likelihood of classifying top institutions as top	All	0.9455	0.1988	3.0693***
	No	0.8465	0.3220	
Likelihood of classifying average institutions as top	All	0.0891	0.2490	-2.5991**
	No	0.1931	0.3238	
Likelihood of classifying all institutions as top	All	0.5173	0.1381	-0.0890
	No	0.5198	0.2227	
Average ranking of top institutions	All	2.8762	1.3104	-3.7905***
	No	3.8614	1.6899	
Average ranking of average institutions	All	9.5594	1.5170	1.2461
	No	9.2178	1.5547	

Note: Std. dev. = standard deviation, *t* = value of the Student *t* statistic; \*\*\* = significant at level 0.01; \*\* = significant at level 0.05.

The same analysis (Table 3) also showed that in case of the average quality institutions the mean of the rankings of the non-specific advertisements was somewhat better but the difference is not significant. These results confirm both hypotheses 1 and 2.

Involving the not totally specific nor totally unimportant advertisements, too, we found if at least the important information was specific, then the top institutions were classified as top ones more likely than if only unimportant or no information was specific. In case of the average quality institutions the effect is the opposite. In the ranking assignment specificity of information improved the accuracy of the decisions only for the top institutions significantly, though the direction of the effect is the same as expected in case of the average quality institutions as well (more specified advertisement causes worse ranks). These results confirm hypothesis 3. Table 4 contains the statistics.

**Table 4:** Comparing the results of both classification and order ranking assignments by the true quality of the institutions in cases when at least the important items are specific and when no or only the unimportant items are specific ( $N = 101$ )

Test variable	Specific items	Mean	Std. dev.	<i>t</i>
Likelihood of classifying top institutions as top	Important or all	0.9356	0.1900	2.6906***
	Unimportant or no	0.8614	0.2678	
Likelihood of classifying average institutions as top	Important or all	0.0809	0.1909	-2.6007**
	Unimportant or no	0.1683	0.3005	
Likelihood of classifying all institutions as top	Important or all	0.5083	0.1090	-0.2816
	Unimportant or no	0.5149	0.1887	
Average ranking of top institutions	Important or all	3.2508	1.2879	-3.1784***
	Unimportant or no	4.0957	1.6134	
Average ranking of average institutions	Important or all	9.5429	1.3668	1.5477
	Unimportant or no	9.1452	1.4693	

Note: Std. dev. = standard deviation, *t* = value of the Student *t* statistic; \*\*\* = significant at level 0.01; \*\* = significant at level 0.05.

Another paired t-test revealed if the unimportant information items were the only specific ones, the ranks of top institutions worsened significantly compared to the case if no items of information were specific (thus increasing the accuracy of unimportant items only had an adverse effect). This was the only significant effect comparing the cases where no vs. only the unimportant items were specific. These findings support the second part of H3. Table 5 presents the related data.

In the following analysis we found if the unimportant pieces of information were the only specific ones, average quality institutions were evaluated as top ones significantly more frequently than when only important information was specific. In case of top institutions there was no such significant effect. In case of top institutions average rankings tended to be more correct if the important information items were the only specific ones than if the unimportant items were the only specific ones. Average quality institutions did not differ in rankings in this comparison. As specificity of important information enhances, while specificity of unimportant items worsen the decision making process, these results support our third hypothesis (H3). Table 6 shows the statistical data.

**Table 5:** Comparing the results of both classification and order ranking assignments by the true quality of the institutions in cases when only the unimportant items are specific and when no item is specific ( $N = 101$ )

Test variable	Specific items	Mean	Std. dev.	t
Likelihood of classifying top institutions as top	Unimportant only	0.8911	0.3131	1.2164
	No	0.8465	0.3220	
Likelihood of classifying average institutions as top	Unimportant only	0.2178	0.4148	0.6850
	No	0.1931	0.3238	
Likelihood of classifying all institutions as top	Unimportant only	0.5545	0.2335	1.3279
	No	0.5198	0.2227	
Average ranking of top institutions	Unimportant only	4.5644	2.2866	3.2602***
	No	3.8614	1.6899	
Average ranking of average institutions	Unimportant only	9.0000	2.5807	-0.7979
	No	9.2178	1.5547	

Note: Std. dev. = standard deviation,  $t$  = value of the Student  $t$  statistic;

\*\*\* = significant at level 0.01

**Table 6:** Comparing the results of both classification and order ranking assignments by the true quality of the institutions in cases when only the unimportant items are specific and when only the important items are specific ( $N = 101$ )

Test variable	Specific items	Mean	Std. dev.	t
Likelihood of classifying top institutions as top	Unimportant	0.8911	0.3131	-0.8308
	Important	0.9208	0.2714	
Likelihood of classifying average institutions as top	Unimportant	0.2178	0.4148	3.1103***
	Important	0.0792	0.2714	
Likelihood of classifying all institutions as top	Unimportant	0.5545	0.2335	1.8826*
	Important	0.5000	0.1581	
Average ranking of top institutions	Unimportant	4.5644	2.2866	2.2973**
	Important	3.7723	1.9436	
Average ranking of average institutions	Unimportant	9.0000	2.5807	-1.1602
	Important	9.4059	2.1456	

Note: Std. dev. = standard deviation,  $t$  = value of the Student  $t$  statistic;

\*\*\* = significant at level 0.01; \*\* = significant at level 0.05; \* = significant at level 0.10

## 5. Conclusions

This paper aimed to reveal the relationship between the quality of information published by the higher education institutions and their customers' evaluation on them. Our findings confirm our 3 hypotheses: Top institutions were classified as top ones more likely and were ranked lower (better) on average if more specific information were available than if less specific information was provided that means that more specific information gives them a competitive advantage (H1). In case of average quality institutions, however, less specific wordings lead more likely to being classified as top ones and lower (better) ranks on average that shows that more specific information means a competitive disadvantage for these types of institutions (H2). Given more important information being specific our results show that the students evaluate the institutions more precisely in case of both the top and the average quality institutions while their evaluation is less accurate if unimportant information is specific (H3).

These results, however, may be influenced by some cultural traits, thus research may be expanded to students from other countries in the future. Another direction of the improvement of our research is to examine these effects in case of higher education institutions outside the U.S. Moreover, we can investigate whether the information providing behaviour of higher education institutions corresponds to our findings (i.e. top universities publish more specific while average or low-ranked universities publish no or non-specific information) by scanning the homepages of those institutions.

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