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Comparing Attitudes Toward Computers of Polish and American Prospective Teachers

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The work presented here is a second report from a long-range project on studying students' attitudes toward computers. The project started from our skepticism of the wide-spread belief that prospective teachers are less likely to embrace computer technology than other students. The first set of results was presented in Paprzycki and Vidakovic (1994). In that study, the differences between the attitudes toward computers of students of the University of Texas at the Permian Basin (UTPB) and the University of Hartford (UH) was studied. Our data at that time indicated that the choice of becoming a prospective teacher has a minimal correlation with the students' attitudes toward computers. We have found that the primary factors were gender, age and the school attended. Since then three things have happened. First, Stanislaw Ubermanowicz (of Adam Mickiewicz University, Poznan, Poland) joined our team; second, a series of modifications to the initial instrument was made; and third, we have collected additional data at St. Cloud State University (SCSU) and Adam Mickiewicz University (AMU) as well as increased the total amount of data collected at UTPB. The primary aim of this paper is to present the results of comparing the attitudes toward computer of Polish and American students (prospective teachers and other majors). In addition we made a number of comparisons similar to the earlier study studying the correlations between age, gender, the school attended, and attitudes toward computers.

Methodology

To obtain measures of students' attitudes toward computers, a self-report questionnaire based on a five-point Likert scale (Grounlund, 1981) was developed. It consisted of 24 statements expressing positive and negative attitudes toward computers, acquiring knowledge about computers and their use, and a computer literacy course. These questionnaires were administered during the initial meetings of computer literacy courses offered at different institutions. The early results have been presented in Paprzycki and Vidakovic (1994). In the next step, a small number of changes (based on the analysis of the data, input from our colleagues, and the students' comments) were made. Some of the original statements were rewritten to make them clearer to the students (e.g., complex and long sentences were rephrased), one of the original statements was removed (No. 13, see Appendix). There were two goals of the creation of the updated version of the instrument. First, to make it clearer to the responding students and second, to be able to reuse previously collected data. We have decided that since the changes were relatively small, the data collected earlier can be combined with the new data. The Appendix contains the new version of the survey. It is worth mentioning that translating the survey into Polish was quite a challenge (details of this process can be found in Ubermanowicz and Paprzycki, in preparation).

To each statement, participants selected one of five options on a Likert scale by indicating whether they *strongly disagree, disagree, undecided, agree, and strongly agree*. Weights were assigned to each response. For statements expressing a positive attitude the assigned

weights were: 1- for "strongly disagree," 2- for "disagree," ... 5- for "strongly agree." For the statements expressing a negative attitude, the weights were reversed. The results were statistically analyzed using ANOVA combined with the Duncan's multiple comparison test (for the statistically significant ANOVA results). For the multiple comparison test the standard significance level of 0.05 was used.

In choosing the factors with respect to which we analyzed the data, we have elected to match the previous study. The students' attitudes were studied from five angles. First, overall attitude was considered. All of the statements except No. 13 were combined. (Since the data from the earlier version of the survey was combined with the data collected using the new questionnaire, we have omitted the responses to the old version of the statement No. 13 as well.) As previously, in addition to the study of the overall attitude, statements were combined into four groups representing particular areas of interest. Statements 1, 2, 4, 6, 7, 8, 9, 16, and 21 characterize the individuals' current feelings about computers. Statements 3, 5, 17, 20, 22, and 24 assess the perceived personal need for the computer (in the past, the present and the future) and the perceived overall role of computers. Statements 10, 11, and 15 address the individuals' attitudes toward acquiring knowledge. Statements 12, 14, 19, and 23 deal with the attitude toward the computer literacy course itself.

Four factors were considered: age, academic major, gender, and country. Students were divided into three age groups: young (age below 21 years), middle-aged (between 21 and 27 years) and older (age 28 and above) students. Academic majors were combined into 5 groups: prospective teachers, natural science students, arts and humanities students, business students and undecided. However, since our primary goal was to study the attitudes of prospective teachers, we have also divided the students into two categories: the category prospective teachers and the category comprising all the other majors (for ease of reference, we will call them "non-teachers"). Then, we ran comparisons between Polish prospective teachers and non-teachers, American prospective teachers and non-teachers, Polish prospective teachers and American prospective teachers as well as Polish non-teachers and American non-teachers. Finally, we have performed a general comparison between the attitudes of Polish and American students.

A total of 68 individuals was surveyed at UH: 34 females and 34 males; 61 young students, 6 middle-aged and 1 older student (with the median at 19 years of age); only 2 students were prospective teachers. A total of 193 individuals were surveyed at UTPB: 122 females and 71 males; 60 young, 58 middle-aged and 75 older students (with the median at 27 years of age); 53 were prospective teachers. A total 36 surveys were collected at SCSU: 25 females and 11 males; 18 young, 13 middle-aged and 5 older students (the median was at 21). All of the students were prospective teachers. A total of 81 individuals was surveyed at AMU: 50 females and 31 males; 78 young, 1 middle-aged and 2 older students (the median at 19). There were 33 prospective teachers in this group.

Results

In the following subsections, only statistically significant differences among the various categories are reported.

Overall Attitude

We have found that the overall attitude of Polish prospective teachers toward computers is slightly less positive than that of American prospective teachers, and that the attitudes of Polish "non-teachers" are also minimally less positive than their American counterparts. In general, students at UTPB had the most positive overall attitude toward computers of all the four universities, while the students at AMU- the lowest. The only other noteworthy fact was that the middle-aged and the older students had similar and more positive overall attitudes toward computers than the young students. This last fact may explain why the students at UTPB had so high an overall attitude toward computers: of the four universities, UTPB has the highest proportion of older students.

Feelings about Computers

The only difference observed was that students of AMU, UH and UTPB have similar levels of comfort with computers whereas SCSU students felt less comfortable about them.

The Perceived Role of Computers and the Personal Need for a Computer

We found that Polish non-teachers perceive much smaller need for computers than their American counterparts (also the overall perception of the need for and role of computers of Polish students was much lower than that of American students). If we compare the attitudes across the four schools, UTPB and SCSU students perceived need for and role of computers was similar and higher than that of UH students, which in turn was higher than that of AMU students. The only other statistically significant difference was that young students perceived lesser need for and role of computers than the remaining two student age groups. Again, the large proportion of older students at UTPB can explain this fact. It is interesting to note that although SCSU students feel uncomfortable with computers, they nonetheless perceived a definite need for computers and recognize their important role.

Attitudes toward Ccquiring Knowledge

We have found out that Polish prospective teachers have a more positive attitude toward acquiring computer knowledge than Polish "non-teachers" (which goes against a widely held belief in Poland). At the same time, American "non-teachers" have more positive attitudes toward acquiring knowledge than Polish "non-teachers" (overall, the attitude toward acquiring computer knowledge of Polish students is lower than that of American students). UTPB students have the most positive attitude toward acquiring computer knowledge while the attitudes of the students in the remaining three schools are close to one another. Again, age is an important factor: older students have a more positive attitude toward acquiring computer knowledge than do young students. (Once again, this explains the very positive attitude of UTPB students.)

Attitudes toward the Computer Literacy Course

We have found that American "non-teachers" are more positive toward the course than Polish "non-teachers" (the overall attitude of Polish students is less positive than that of American students). Let us note that this corresponds with the above result: not only is the attitude of American "non-teachers" toward acquiring computer knowledge more positive than that of their Polish counterparts, but so is their attitude toward the computer literacy course. The UH students have the lowest attitude toward the course, whereas the UTPB students value this course the most; the remaining two schools represent an in-between attitude. As previously young students have less positive attitudes toward the course than the remaining two age groups. It is only in the attitude toward the course that a difference between the five groups of academic majors was observed. We have found that business majors have a significantly more positive attitude toward the course than the other majors, indicating perhaps an increased awareness of, on the one hand, the usefulness of the computers and, on the other, the inescapability of their future encounters with them.

Conclusion

We have presented the results of a comparative study of attitudes toward computers between students of one Polish and three American universities. Not unexpectedly American students express more positive attitudes toward computers than do Polish students. This is probably explained by the fact that in Poland computers are still largely inaccessible. Computers are expensive; not only can the majority of people not afford one, but neither can schools (at any level, including the universities).

We were not able to find evidence that becoming a prospective teacher has any correlation with attitude toward computers. The only important factors influencing attitude were: age (young students exemplify less favorable attitudes than do older students) and the school attended. It can be questioned, however, whether the latter factor is really significant. It is possible that the results could be explained in terms of students' age (the correlation in the results between age and positive attitudes was very strong, since the samples were uneven in terms of both age distribution and gender distribution.). Academic major as well as gender were not found to be significant.

Currently we have started additional data analysis where the relations between the statements as well as how well each statement discriminates the attitude in question, are studied. The cooperation with Adam Mickiewicz University allowed us also to find that some of our assumptions about students' perceptions as positive or as negative may be incorrect. Our initial assumptions were that our attitudes and attitudes of our students were rather positive- or at least we interpreted it this way. Only the confrontation with the results from a less favorable environment and listening to the comments of some Polish students pointed to us the need for reevaluating our initial assessment. We expect, by the end of Spring semester 1995,to have designed a new instrument, taking into account all of the above information. At the same time a database, currently being developed, willbe ready to facilitate automatic data collection. Finally, we would like to invite readers of this paper who are interested in using our instrument to contact us.

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Appendix

Indicate the extent to which you agree or disagree with the statements listed below. Be sure to respond to every statement.

1. I am frustrated by computers.
2. My experience in working with computers is positive.
3. Many times in the past when I needed to use a computer I didn't know how to do it.
4. I feel comfortable each time I start to work with computers.
5. I will use the computer after college.
6. Only smart people use computers.
7. I think that I will be successful working with computers.
8. I am afraid that one day computers will take over and enslave people.
9. I think that computers save me time.
10. One can learn about computers by her/himself.
11. I am interested in learning more about computers.
12. Computer literacy courses should be a requirement for all high school students.
13. I have used computers in the past.
14. This course will make me appreciate the use of computers in my field.
15. I am always ready to learn new things.
16. I feel uncomfortable when I see that other students know more about computers than I do.
17. I think that the computer is a tool that I will need to use.
18. This course will help me in other courses whrer computers are used.
19. This course will have a big impact on my choice of courses I will take next semester.
20. Using computers should be a part of all courses.
21. One can get addicted to the computer just as one can get addicted to drugs.
22. In the future I definitely expect to use computers.
23. Taking this course will help me improve my attitude toward computers.
24. I think that the role of computers in daily life will increase in the next ten years.

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