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CONSTRUCTIVIST PRINCIPLES IN HUMANISTIC SUBJECTS TEACHING ONLINE

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ABSTRACT

This study aimed at acquainting physical education students' opinion on the pedagogic activity of the humanistic subject's teachers using constructivism principles during online teaching. One hundred thirteen students of the third semester of the Physical Education Faculty at Physical Education Academy in Gdansk participated in this study. There were 38 female and 75 male students. Scale of the pedagogic actions of the constructivist teacher in the humanistic subjects teaching online. This scale was specially constructed for the need of the present study. Statements in this scale were modeled on the description of principles which are used by the constructivist teacher, and concerning selected aspects of learning process such as: cognitive, social, and emotional (Sztejnberg, Jasiński, 2015: 120-126). The obtained results enabled to see high percentage of the positive students' opinion directed to the teacher, who introduced constructivist principles during online teaching. Physical education students gave the highest scores to the social aspect of teaching with the use of constructivist principles; the second place was awarded to the cognitive aspect. Slightly lower scores received emotional aspect of teaching. In every listed aspect of online learning two statements received over 50% received an answer "I decidedly agree". It means that the students distinguished six actions typical for the teacher, according to the constructivist principles.

Key Words: Constructivist principles in teaching, physical education students.

INTRODUCTION

The term constructivism means diverse intellectual trend to explain mechanism of knowledge and meaning, and central problems in physiology and knowledge sociology (Dylak, 2000; Bołhuć, 2011) [1,2]. Constructivism is being present in several concepts and theories formulated on the basis of culture philosophy, cognitivism, literary studies, science of communication, neurophysiology, pedagogics, psychology, and already mentioned knowledge sociology (Wendland, 2011, 2014) [3,4]. Constructivism in an education most frequently refers to the learning conception described in constructivist-developmental attitude known in Jean Piaget's (1966, 1992) [5,6] psychology of the cognitive development. Piaget turned special attention to

the person individual cognitive competence (similarly to the radical constructivists like Ernst von Glaserfeld, 1966) [7], and constructivist-social attitude referring to Jerome Seymour Bruner's socio-cultural theory (1960, 1978) [8,9], and Lew Siemionovich Vygotsky (1989) [10], in which social, group competence is accented. In the constructivist-developmental attitude learning is understood as an active, exploratory, self-reliant construction and reconstruction of the mental models of reality in the problem solution situation. Pupil recognizes the problem at the beginning of his mental activity and solving it creates in his mind representation of reality being used in new situations. The teacher organizes so-called learner's environment, enabling his self-reliant research work. In practice, the teacher prepares places for the subsequent experiments, stimulates to ask problem questions, and manifests an interest in learner's research results. Constructivist-social attitude emphasizes the role of aid and intervention activities of the adult expert. These activities take the form of the individual social negotiations, permanently embedded in the defined cultural context. They are culturally relative social construct, being not only objective of reality reflection (Klus-Stańska, 2009 [11]; Marek, 2017 [12]. A young man during learning acts as researcher, is active, and through his actions constructs his own knowledge of the world Rosalska, Zamorska, 2002, pp. 83-84) [13]. This knowledge without participation of the adult persons in both initiated and realized research procedures is not enough to build his accurate and adequate knowledge. Despite noticeable differences (…), both attitudes strongly stress possibilities to aid an individual development of each child (Żądło, 2011; p. 122) [14]. Therefore, teacher's competent care and help is necessary to level learner's developmental dependence. Teachers, who want to follow constructivist teaching model (…), must to learn how to build a model of the conceptual constructions, being used by his pupils (Moroz, 2015: p. 81) [15].

It was very interesting to know the physical education students opinion on the pedagogic activities of the humanistic subjects teachers, acting according to the constructivist principles during online teaching. Such was an objective of the present study.

OBJECTIVE OF THE STUDY

This study aimed at receiving the answers to the following questions.

1. Which constructivist principles used by the teacher in his pedagogic activity the physical education students distinguish during humanistic subjects teaching online?
2. Which constructivist principles used by the teachers may be recognized as typical for them?

MATERIALS AND METHODS

Participants

One hundred thirteen physical education students at the Physical Education Academy, Gdańsk participated in this study. The group included 38 female and 75 male students of the second year (third semester) of studies. Their age was 19 to 24 years (M=20.734; SD=1.001). Humanistic subjects – practical profile − were learnt online during two past semesters.

Methods

Scale of the assessment of pedagogic activity undertaken by the teacher-constructivist of the humanistic subjects (Constructivist Principles in Teaching – CPT) was used in this study. This scale was designed especially for the present study. Its statements were based on the description of the principles used by the teacher-constructivist (Sztejnberg, Jasiński, 2015, pp. 120-126) [16]. The teacher as a person consequently introducing constructivism theory into his pedagogic activity concerning the following teaching aspects: cognitive, social, and emotional (p. 121). In this scale, cognitive aspect [CA] is described by 4 main and 9 complimentary statements, social aspect [SA] – 3 main and 7 complimentary statements, and emotional aspect [EA] by 3 main and 7 complimentary statements. A main statement constitutes peculiar code of the pedagogic activities in teaching. This code should be used by the teacher constructivist. The students participating in this study had to assess 33 groups of statements describing teachers' activity during teaching online. The students used a 5-score scale in which: 0 – decidedly disagree; 1 – disagree; 2 – have no an opinion; 3 – agree; 4 – decidedly agree. Each selected score was entered into the square parenthesis at the end of each statement. Finally, biographic notes were included at the end of the scale, containing student's age and sex.

The study was carried out after two semesters of the online teaching, in early February 2021. Both lectures and exercises were realized by the same teacher in real time with Teams program,

twice a week, according actual weekly program. Obtained students' opinion concerned one subject taught in the actual semester, i.e. *Psychologia rozwoju i wychowania dziecka* (Psychology of Child Development and Education), and were addressed to the teacher who never claimed to be teacher-constructivist. He is a psychologist, who carried out diagnostic clinical studies on the individual human behavioral differences in stress. There were two exceptions. Two participants were foreigners and their opinion related to other Humanistic subjects, i.e. Polish and English languages. However, their scores were included to further analysis.

RESULTS

Descriptive statistics of the obtained data

Scale used in this study proved to be a suitable tool to acquaintance the teacher-constructivist pedagogic activity. Excellent result of alpha internal consistency: Cronbach Alpha: 0.94 guarantee accuracy of CPT scale (Jankowski, Zajenkowski, 2009) [17]. Summary of CPT scale reliability is presented in Table 1.

Table 1. Results of CPT scale reliability analysis

Statistics / Scale	M	SD	∑	VA	SK	KU	α	α stand
CPT	104.743	17.577	11836	308.978	-0.304	0.072	0.947	0.949

Legend: Number of the statements in the scale – 33; number of reliable cases – 113; min. – 55; max. – 132; M – arithmetical mean; SD – standard deviation; VA – variance; SK - skew; KU – kurtosis; α – Cronbach alpha.

Analysis of the arithmetical mean of the students' scores, concerning teacher activities during online teaching, enabled to see that the highest scores were given to the statements describing social aspect (SA) of his work (M=3.214). Slightly lower scores were granted to the cognitive aspect (CA; M=3.163) as well to emotional aspect of teaching (EA; M=3.137). Figure 1 illustrates this analysis.

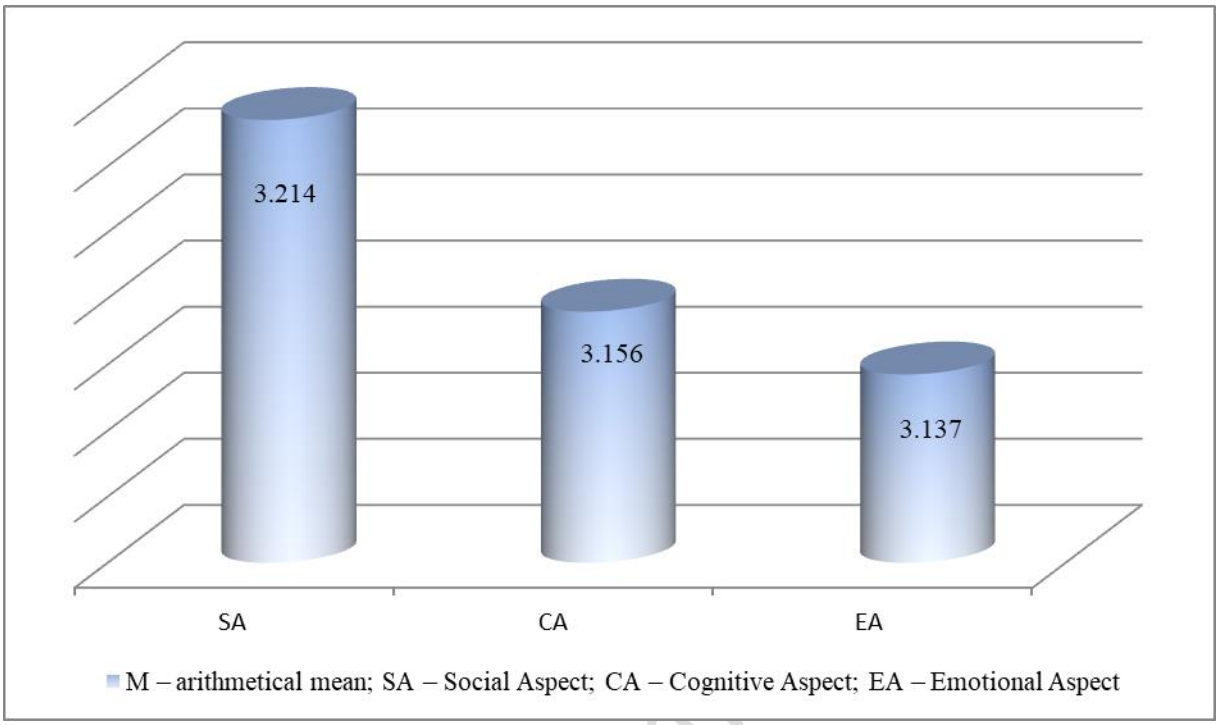

Fig. 1. Histogram of the mean scores granted to the subscales of the CPT Scale.

Additionally, the obtained results were analyzed in the groups differentiated for the examined student's sex. Differences were statistically significant at $p<0.05$ and $p<0.001$ for 26 analyzed statements. Female students significantly more often appreciated teacher's activity than male students. Referring to seven statements in CPT Scale (4 main statements: CA1, CA2, CA3, and EA3), independent variable "sex" did not statistically significantly differentiate the examined student's opinion on the said teacher's work.

Typical pedagogic activities in accordance with constructivist principles

As typical constructivist principles used in the pedagogic activity of the rated teacher were these given highest score, i.e. an answer decidedly agrees (4 scores). Such scores gave over 50% of the examined students (see Woynarowska, Tabak, 2013, p. 659) [18]. It is worth noting that all constructivist principles used by the teacher during teaching online and presented to the

examined students received the scores 3 (agree) and 4 (decidedly agree). Such scores gave 80% to over 90% of all examined students.

Qualitative analysis of the obtained data enabled to see that in Social Aspect (SA) two statements "decidedly agree – 4) were chosen by over 50% of the examined students. "The teacher awake cognitive curiosity, while learning the said subject" (54.87%) and "The students are responsible for their learning" (60.14%).

Similar statements in cognitive aspect (CA) were given the highest score (decidedly agree – 4; Table 2) by over 50% of the examined students. First statement is "The teacher develops increases the students independent thinking" (51.33%), and the second: "…wants the students to use various knowledge sources while learning and engage all their senses" (62.83%).

Two statements in emotional aspect (EA) were marked by over 50% of the examined students, namely: "The teacher asks questions encouraging the students to thinking" and "Students use different sources of knowledge while learning". Both statements were chosen by 51.33% of students. Therefore, six statements referring to the constructivist principles used in the pedagogic activity may be recognized typical for the said teacher.

Detailed analysis of the obtained results and frequency of the chosen statements are presented in tables 2-4.

Table 2. Social aspect in teaching by the teacher constructivist

Statement \ Score	0 %	1 %	2 %	3 %	4 %
SA.1 Students give complete and exhausting answers to the said question, expressing own opinion, explaining phenomenon or event, assessing opinions of other people	3.54	0	11.5	39.82	45.13
SA.1a The teacher arouse students' cognitional curiosity during learning the said subject online	**3.54**	**0**	**4.42**	**37.17**	**54.87***
SA.1b The teacher aims at creating a climate conductive to learning	1.77	0	12.39	47.79	38.05

SA.1c The teacher provides his students material enabling undertaking multilateral cognitive activity	2.65	0	8.85	46.02	42.48
SA.1d The teacher shows his students usability of acquired knowledge in their everyday life	0.88	0	5.31	48.67	45.13
SA.2 The teacher arouses interest in learning	1.77	0	10.62	48.67	38.94
SA.2a The teacher structure of his knowledge matches to his students knowledge structure	4.42	0	29.2	38.94	27.43
SA.2b The teacher creates pedagogic situations and upgrading them, if it results from his students individual interests	1.77	2.65	14.16	46.9	34.51
SA.2c Students are responsible for their learning	**1.77**	**0.88**	**5.31**	**31.86**	**60.18***
SA.3 The teacher creates pedagogic situations in which his student learn by cooperation	1.77	2.65	16.81	46.02	32.74
SA.3a Students interactions based on partnership during learning online and effective verbal and nonverbal communication during learning in the small groups contribute to rapid changes in their knowledge and skills	1.77	0	11.5	48.67	38.05

Legend: 0 – decidedly disagree; 1 – disagree; 2 – have no opinion; 3 – agree; 4 – decidedly agree; bold font and asterisk – statements given the highest score by over 50% of responders.

Table 3. Cognitive aspect in teaching by the teacher constructivist

Score / Statement	0 %	1 %	2 %	3 %	4 %
CA.1 The teacher refers to the earlier students' knowledge of the said theme during online teaching	0.88	0	9.73	49.56	39.82
CA.1a Each newly formed word is added to the knowledge basis existing in the students' mind	0.88	0	7.96	49.56	41.59

CA.1b Student understands this what he learns	2.65	0	13.27	47.79	36.28
CA.1c Student knows how to apply acquired knowledge to the situations other than the typical ones , known from the lessons situations but a new problematic situations	2.65	0	17.7	38.94	40.71
CA.2 The teacher develops his students independent thinking	**3.54**	**0**	**14.16**	**30.97**	**51.33***
CA.2a The teacher stimulates his students to ask questions and seek the answers	1.77	0	11.5	43.36	43.36
CA.2b Students make hypothesis during learning, i.e. create possibilities of dissolving the said problem	2,65	0	17,7	49,56	30,09
CA.2c Students plan actions verifying by solving the problem	4.42	0	16.81	47.79	30.97
CA.3 The teacher tries to convince his students to use various sources of the knowledge and engage all their senses during learning	**1.77**	**0**	**4.42**	**30.97**	**62.83***
CA.3a Students – thanks to multisensory learning, experimenting, self-reliant exploring of the surrounding reality may learn more effectively	3.54	0	21.24	40.71	34.51
CA.4 The teacher uses key words engaging various cognitive processes during interpersonal communication with his students	0.88	0	9.73	47.79	41.59
CA.4a Lower order (compare, illustrate, classified, interpret)	3.54	0	33.63	33.63	29.2
CA.4b Higher orders (analyze, evaluate, plan, invent, and produce).	1.77	0	31.86	33.63	32.74

Legend: see table 2.

Table 4. Emotional aspect in teaching by the teacher constructivist

Statement / Score	0	1	2	3	4

	%	%	%	%	%
EA.1 The teacher asks questions which encourage his students to think	**2.65**	**0**	**4.42**	**41.59**	**51.33***
EA.1a The teacher creates situations in which student is not only free to think but also to act	1.77	0	13.27	51.33	33.63
EA.1b Students to learn are using various sources of the knowledge	**2.65**	**0**	**9.73**	**36.28**	**51.33***
EA.2 The teacher favors experiencing the difference between his students knowledge about the said problem and new information incoming from various sources	1.77	0	15.04	53,1	30.09
EA.2a Student during learning has a possibility to critically analyze learnt material	3.54	0	15.93	39.82	40.71
EA.3a The teacher after asking the question leaves the student time to consider his answer	11.5	0	15.93	34.51	38.05
EA.3b The teacher is not asking questions requiring only alternative answers „yes" or „no"	5.31	0	9.73	38.94	46.02
EA.3c The teacher asks creative and research questions, such as „What would be, if …?" „What you think, in which direction it will move, if ..?", "How would you change …?"	6.19	0	24.78	42.48	26.55

DISCUSSION

Generally, there is an agreement that constructivism are not uniform conceptions but a collection, finding support in the cognition psychology, which consider human being as an individual subject who acquaints the world through his own experimental effort; observes it, formulates problems and hypothesis, experimenting and ordering accumulated knowledge, using it at the same time, taking stance to the world and transforming it (Klus-Stańska, 2000 [19]; Sadon-Osowiecka, 2011 [20]; Borawska-Kalbarczyk, 2012 [21]; Schmidt, 2010) [22]. Guidelines of the constructivist teaching model and its basing on the belief that the personal knowledge and reflection on the own experience are perfect starting point to the cognition and

understanding the world and an own activity is determining learning (Urbańska, 2018 [23]; Klus-Stańska, 2019 [19]). It is also known that the knowledge is very complex nowadays. Therefore, the teacher cannot "teach" but only support his students individually in their seeking the knowledge. He may also do it in the group work. The teacher has to plan and organize a proper students' environment, which is in their educational center and actively forms their own knowledge (Buchcic, 2021, pp. 48-49 [2]).

Changes in thinking about teaching and learning are characteristic for this teaching model. Teacher's role is also different. Teacher introducing innovations may individualize education, consider various styles of learning and motivate the students to work, and become organizer of the educational situations, while his learners become his equal partners, gaining independence and self-consciousness (Klus-Stańska, 2000 [19], 2002 [24]. 2010 [25], 2019 [26]; Gołębniak, 2005 [27]; Filipiak, 2011 [28]; Borawska-Kalbarczyk, 2012 [21]; Urbańska, 2018 [23]; Szkurłat et al., 2019 [29]; Reingard, 2021 [30]). Constructivist model of teaching has more and more followers, because it is characterized by crossing traditionally fixed range of the scientific disciplines and sub disciplines (Gałaś, 2016, p. 9 [31]). Several arguments in favor constructivism innovation and positive effects of the teacher constructivist pedagogic activity exist in the literature. An example is pre-school children teaching geography (Sadoń-Osowiecka, 2009 [20], 2011[32]), mathematics (Semadeni, 2016 [33]), biology ((Banaszak, 2017 [34]), and aware of the ecology (Buchcic, 2021 [2]). In case of the educational practice and teaching of students, constructivism manifests itself in openness to: students' creativity to access the knowledge and its building, their experiments and use of the information technologies in the future teacher pedagogic skills Dylak, 2000 [1]). There are also publications which authors do not share and opinion about validity of use constructivist model in an education (see Brzezinka, 2005 [35]; Zalewski, 2019 [36]), indicating pedagogic activities more effective in teaching.

Constructivism in education – pluses and minuses

Constructivist pluses and minuses in education grow parallel with the number of both its supporters and opponents. Examples of these "pluses and minuses" grouped in four categories

(methodological dilemmas, innovation, degree of the teacher's intervention, and interpersonal interactions) are presented below.

Methodological Dilemmas

Pluses:

- stress is on the learner who by active methods discovers a knowledge independently;
- departure from Jean Piaget's assumptions on the significant differences between thinking of children and adults (Carey, 1985 [37], cit. Klus-Stańska, 2019, p. 14 [26]);

Minuses:

- teachers lack of control leads to the errors in acquainting reality new for learners (Brown, Campione, 1994 [38]);
- active methods may have manipulative character in spite of the declarative cognitive freedom;
- teacher forces a course of actions' stages of the work, technical aids, and in consequence reasoning and concluding;
- in practice, lectures intermingle with exercises;
- Innovative methods are the best during learning of the practical skills (Zalewski, 2019 [36]).

Innovation

Pluses:

- is a source of an inspiration for the development of the contemporary education of teachers;
- in higher degree than objectivist paradigm stress out learners activity during learning;
- favors creation (Antroszko, 2018, p. 1230 [39]);
- conceptual independence may be realized both individually and in the process of non-tutoring learning with peer in explorative speech conditions (Mercer, Hodgkinson, 2008 [40]; cit. Klus-Stańska, 2019, p. 14 [26]);
- accentuate association between the language and thinking (Klus-Stańska, 2002, pp. 23-63 [24]);
- innovation may increase learners interest with new subjects;
- enables to adapt to both a need and pace of the learner individual work;

- digital learners' activation may be attractive for them;
- causes acquisition responsibility for educational process by the learners;
- Shifts an accent from teaching to learning (Reinhard, 2021, p. 18 [30]).

Minuses:

- possible if they are separated from the ideology staffage (Bohuć, 2013 [41]);
- individual knowledge absorption is possible, if information and initial skills are storage earlier and may serve as a base (Kirschner, Sweller, Clark, 2006 [42]);
- change of the teacher is necessary, who tries consult and moderates knowledge with his students instead of handing over and control it (Reinhard, 2021 [30]).

Degree of the teacher's intervention

Pluses:

- allows to see and appreciate importance of the learners' and teachers' colloquial knowledge in the educational context (Klus-Stańska, 2002, p. 23 [24]);
- learner acquaints a reality himself from the beginning to the end (unaided discovery);
- teacher's role is limited to minimum; the teacher discreetly moderates (Zalewski, 2019 [36]).

Minuses:

- the teacher does not control his students "discoveries";
- the teacher leads his students, indicates them line, gives some liberty but controls their achievements at the same time;
- the teacher directly passes a knowledge on while the students' activity is concentrated on its absorption and understanding (Zalewski, 2019 [36]).

Interpersonal interactions

Pluses:

- favors greater tolerance in the interpersonal interactions;
- favors more casual communication during lessons (Atroszko, 2018, p. 130 [39]);
- interactions between learners increase effective learning, motives and allow to verify their ideas with the views of other learners (Bołtuć, 2013 [41]);

- constructivist orientation increases tolerance in the social interactions (Glaserfeld, 2010, p. 43 [43]);
- learner "learns better" cooperating with his peer, even if he will create imperfect ideas in comparison with perfect knowledge received from his teacher (Marek, 2017, p. 122 [12]);
- positive role of peer-to-peer interactions in the process of education, especially e-learning and blended learning, didactic substance created by the students (Sener, 2007 [44], cit. Bołtuć, 2013p. 4 [41]).

Minuses:

- possible loosing of the education aim, which is passing the students skills and knowledge collected by the scientists and experienced persons (Bołtuć, 2013 [41]).

A few significant remarks cited authors of both opinions are quoted below instead of the commentary to the given pluses and minuses of the constructivism in education. Zalewski (2019 [36]) argues that arguments between followers of the education classic model and so-called progressive education refer to the teaching method. It is commonly known that teaching through discovery (active) is more effective. Therefore, traditional model of teaching should finally be given up. The cited author's opinion is such: small number of the comparative studies confirms radical constructivist principles. Even the scientists who do not approach to the methodological problems so radically, comparing only direct and exploratory" here and now" teaching, confirm superiority of the first. Results of the studies aiming at comparing both methods of learning confirm it. Learners in the third and fourth class were divided into two groups and learnt designing of the scientific experiments connected with movements of balls made of the different materials. In one group, the teacher explained how to design such an experiment. In the second group, learners were not instructed by their teacher, it was found that the learners directly instructed achieved the results twice higher than these learning alone (77% vs. 23%) (Klahr and Nigam, 2004 [45], cit. Zalewski, 2019 [36], p. 4). Another meta-analysis of 100 studies confirmed better results of the directed teaching. However, the obtained results differed depending on the number of learners, learners' aim, and research method (Alfiery et al., 2011 [46], cit. Zalewski 2019, p. 4 [36]).

A different standpoint opponent of the constructivism in education does not change belief of some scientists that … constructivism brings a hope to teach learners reasoning. Dylak (2000) [1] is convinced that …going out to learners only and always with the world's picture already described with documented theses must lead to the dogmatism, to instructive teaching, indoctrination in place of an education. Bołtuć (2013 [41]) advises to separate positive aspects of constructivist's activity in education from wider implication of their educational philosophy, especially if these aspects are implications with which several constructivism supporters do not agree in their educational activity. Therefore, it is worth in teaching follow Petty's (2018, p. 150 [47]) principle: *the more used methods, more skills and pleasures.*

In case of the own results obtained with the use of CPT Scale, it is worth noting high percentage of the positive students' opinion about the teacher, who teaching online introduced pedagogic activities according constructivist principles. Students of physical education rated the highest teacher's pedagogic activity according to the principles described in social aspect, the second place took cognitive aspect. Slightly lower were scores given to emotional aspect. Puzzling is the choice of the examined students both the teacher and subject out of other humanistic subjects taught during the studies, such as: sociology, psychology, pedagogics, ethics in sport, history of the physical culture. It is hard to say to which extend their choices are resulting from the teacher's pedagogic activity or a desire to endear to this teacher. Anonymity of the tests in program Forms were not anonymous (scores obtained in CPT Scale contained students personal data). Therefore, an interpretation of the obtained results should be analyzed with certain prudence. It is possible that the examined students accept the teacher's pedagogic activity according to the constructivist principles.

Conclusions

An analysis of the obtained results enabled to formulate the following conclusions.

1. Responders positively assessed the teacher's activity, using constructivist principles while teaching humanistic subjects.

2. The students distinguished six pedagogic activities according constructivist principles being typical to the said teacher.

REFERENCES

[1] Dylak S. (2000). *Konstruktywizm jako obiecująca perspektywa kształcenia nauczycieli*. [w:] H. Kwiatkowski, T. Lewowicki, S. Dylak (red.) *Współczesność a kształcenie nauczycieli*. WSP ZNP, Warszawa.

[2] Buchcic E. (2021). Wykorzystanie aspektów konstruktywizmu w kształtowaniu świadomości ekologicznej Studia Ecologiae et Bioethicae, 19, 1, 45-56.

[3] Wendland M. (2011). Perspektywa konstruktywistyczna jako filozoficzna podstawa rozważań nad komunikacją. *Kultura i Edukacja*, 4(83).

[4] Wendland M. (2014). *Konstruktywizm komunikacyjny*. Wydawnictwo Naukowe Instytutu Filozofii Uniwersytetu im Adama Mickiewicza, Poznań.

[5] Piaget J. (1966). Studia z psychologii dziecka. PWN, Warszawa.

[6] Piaget J. (1992). Mowa i myślenie u dziecka, Wydawnictwo Naukowe PWN, Warszawa.

[7] Glasersfeld E. von (1996). *Radikaler Konstruktivismus. Ideen, Ergebnisse, Probleme*. Übersetzung: W.K. Köck. Suhrkamp, Frankfurt am Main Frankfurt am Main.

[8], Bruner J. S. (1960). *The process of education*, Harvard University Press Cambridge, Mass.

[9], Bruner J. S. (1978). *Poza dostarczone informacje*. PWN, Warszawa.

[10] Wygotski L.S. (1989). *Myślenie i mowa*. PWN, Warszawa.

[11] Klus-Stańska D., Nowicka M. (2009). *Sensy i bezsensy edukacji wczesnoszkolnej*. Wydawnictwa Szkolne i Pedagogiczne, Warszawa.

[12] Marek E. (2017). Konstruktywizm determinantem indywidualizacji pracy nauczyciela z uczniem: (na podstawie analizy wybranych programów edukacji wczesnoszkolnej). [w:] U. Szuścik, R. Raszka (red.) Innowacyjność w praktyce pedagogicznej. s.119-132. T. 1, Teoria i praktyka Wydawnictwo Uniwersytetu Śląskiego, Katowice, https://depot.ceon.pl/bitstream/handle/123456789/7769/Konstruktywizm.pdf;sequence=4

[13] Rosalska M., Zamorska B. (2002). Teoretyczne podstawy projektów. [w:] „Uczenie metodą projektów", pod red. B. D. Gołębniak, Warszawa: Wydawnictwa Szkolne i Pedagogiczne Spółka Akcyjna, s. 82-89.

[14] Żądło J. (2011). Indywidualizacja w edukacji wczesnoszkolnej. [w:] I. Adamek, Z. Zbróg (red.). *Dziecko – uczeń a wczesna edukacja*. s. 31-44. Wydawnictwo LIBRON, Kraków.

[15] Moroz J., (2015). Rzeczywistość – poznanie – edukacja w kontekście radykalnego konstruktywizmu Ernsta von Glasersfelda, Kultura i Edukacja 1, 81-6.

[16] Sztejnberg A., Jasiński T.L. (2015). *Wybrane aspekty szkolnego uczenia się*. Wydawnictwo Naukowe NOVUM, Płock.

[17] Jankowski K., Zajenkowski M. (2009). *Metody szacowania rzetelności pomiaru testem*. [w:] K. Fronczyk (red.), *Psychometria, Podstawowe zagadnienia*, s. 84–110. Wyższa Szkoła Finansów i Zarządzania w Warszawie, Warszawa,

[18] Woynarowska-Sołdan M., Tabak I. (2013). Zachowania prozdrowotne nauczycieli i innych pracowników szkoły. *Medycyna Pracy*, 64, 5, 659-670.

[19] Klus-Stańska D. (2000). *Konstruowanie wiedzy w szkole*. Wydawnictwo UW-M, Olsztyn.

[20] Sadoń-Osowiecka T. (2009). *Konstruowanie wiedzy geograficznej w klasach gimnazjalnych. Możliwości i zaniedbania*, Oficyna Wydawnicza Impuls, Kraków.

[21] Borawska-Kalbarczyk K. (2012). Konstruktywistyczna teoria kształcenia w praktyce edukacyjnej – wybrane aspekty. *Kultura i Edukacja*, 1, 87, 135-155.

[22] Schmidt S. J. (2010). Rzeczywistość obserwatora. [w:] „Radykalny konstruktywizm. Antologia" red. B. Balicki, D. Lewiński, B. Ryż, E. Szczerbuk Wrocław: Wydawnictwo GAJT, s. 243-259.

[23] Urbańska M. (2018). Konstruktywistyczny model kształcenia. *Pedagogika, Referaty*. https://profesor.pl/publikacja,33892,Referaty, Konstruktywistyczny-model-ksztalcenia

[24] Klus-Stańska D. (2002). *Konstruowanie wiedzy w szkole*. Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego, Olsztyn.

[25] Klus-Stańska D. (2010). *Dydaktyka wobec chaosu pojęć i zdarzeń*. Wydawnictwo Akademickie Żak, Warszawa.

[26] Klus-Stańska D. (2019). Wiedza osobista uczniów jako punkt zwrotny w teorii i praktyce dydaktycznej. *Kwartalnik Pedagogiczny*, 1, 251, 7-20.

[27] Gołębniak B. D. (2005). Konstruktywizm – moda, „nowa religia" czy tylko/aż interesująca perspektywa poznawcza i dydaktyczna. *Problemy Wczesnej Edukacji*, 1, 1, 13–20. http://www.cen.uni.wroc.pl/teksty/konstrukcja.pdf

[28] Filipiak E. (2011). *Z Wygotskim i Brunerem w tle. Słownik pojęć kluczowych*. Wydawnictwo Uniwersytetu Kazimierza Wielkiego, Bydgoszcz.

[29], Szkurłat E., Piotrowska I., Hibszer A., Rachwał T., Wieczorek T. (2019: Podstawa programowa przedmiotu geografia. Komentarz do podstawy programowej przedmiotu geografia. (seria Vademecum nauczyciela. Wdrażanie podstawy programowej w szkole ponadpodstawowej) Ośrodek Rozwoju Edukacji, Warszawa. https://www.ore.edu.pl/2019/12/poradniki-vademecum-nauczyciela-wdrazanie-podstawy-programowej-w-szkole-ponadpodstawowej/

[30] Reinhard K. (2021). Innowacje pedagogiczne jako przestrzeń do wdrażania i realizowania indywidualizacji kształcenia w szkole. REFLEKSJE 1, 14-19. http://refleksje.zcdn.edu.pl/wp-content/uploads/2020/12/Refleksje-1-2021_druk.pdf

[31] Gałaś M, (2016). (Re)konstruowanie edukacji Teoria i praktyka pedagogiki konstruktywistycznej. *Refleksje*, 6, 8-15.

[32] Sadon-Osowiecka T. (2011). Konstruktywizm obiecującą perspektywą edukacji geograficznej w szkole?, strona z materiałami pomocniczymi Pracowni Dydaktyki Geografii Uniwersytetu Gdańskiego. Dostępne w Internecie pod adresem: http://www.pdg.univ.gda.pl/pliki/ Postmodernistyczne_ujecie_geografii.

[33] Semadeni Z. (2016). Podejście konstruktywistyczne do matematycznej edukacji wczesnoszkolnej. Ośrodek Rozwoju Edukacji, Warszawa. http://www.bc.ore.edu.pl/Content/845/Semadeni_Konstruktywizm.pdf

[34] Banaszak M. (2017). Rola nauczyciela edukacji wczesnoszkolnej w kształtowaniu (się) przyrodniczej wiedzy naukowej dziecka. *Studia Edukacyjne*, 44, 387-398.

[35] Brezinka W. (2005). *Wychowanie i pedagogika w dobie przemian kulturowych.* przekł. ks. SJ. Kochanowicz. Wydawnictwo WAM, Kraków.

[36] Zalewski D. (2019). Konstruktywizm w pedagogice. https://www.edukacja-klasyczna.pl/konstruktywizm-w-pedagogice

[37] Carey S. (1985). *Conceptual change in childchood*. MIT Press/Bradford Books, Cambridge, Mass.

[38] Brown, A. L., Campione, J. C. (1994). *Guided discovery in a community of learners*. In K. McGilly (Ed.), *Classroom lessons: Integrating cognitive theory and classroom practice*. MIT Press/Bradford Books. Cambridge, MA.

[39] Atroszko B. (2018). Konstruktywizm jako źródło inspiracji dla rozwoju współczesnej edukacji nauczycieli. [w:] *Reviewed Proceedings of the Interdisciplinary Scientific International Conference for PhD students and assistants QUAERE 2018, vol. VIII, June 27- 29,* Magnanimitas: Hradec Králové, Czechy, pp. 1224-1231.

[40] Mercer N., Hodgkinson S. red. (2008). *Exploring Talk in School: Inspired by the Work of Douglas Barnes*, Sage, London.

[41] Bołtuć P. (2011). Konstruktywizm w e-edukacji oraz jego krytyka." *E-mentor*, 41,4, 48-54. http://www.e-mentor.edu.pl/artykul/index/numer/41/id/863

[42] Kirschner P.A., Sweller J., Clark R.E. (2006). Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. *Educational Psychologist*, 41, 2, 75-86.

[43] Glasersfeld E. von (2010). *Poznanie bez metafizyki: stanowisko radykalnego konstruktywizmu*. [w:] B. Balicki, D. Lewiński, B. Ryż, E. Szczerbuk, (red.) *Radykalny konstruktywizm. Antologia*. s. 29-46. GAJT Wydawnictwo, Wrocław.

[44] Sener J. (2007). In Search of Student-Generated Content in Online Education, "e-mentor" nr 4 (21).

[45] Klahr D, Nigam M. (2004). The equivalence of learning paths in early science instruction: Effect of direct instruction and discovery learning. *Psychol Sci.*, 15, 661-667.

[46] Alfieri, L., Brooks, P. J., Aldrich, N. J., Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of EducationaAl Psychology*, *103*,1, 1-18.

[47] Petty G. (2018). Nowoczesne nauczanie. Praktyczne wskazówki i techniki dla nauczycieli, wykładowców i szkoleniowców, GWP.