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ANALYSIS OF TEACHERS' VIEWS REGARDING WEB-SITES PREPARED BY STUDENTS IN THE COMPUTER DEPARTMENTS OF VOCATIONAL HIGH SCHOOLS USING THE RASCH MEASUREMENT MODEL

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ABSTRACT
The aim of this study is to analyze teachers' views regarding web-sites prepared by students in the computer departments of vocational high schools using the Rasch measurement model. A survey method has been applied and a working group has been used in the study. As a data collection instrument, a questionnaire developed by the researcher in the light of 12 experts' views is used. Content validity indices (CVIs) and content validity ratios (CVRs) relating to the items are measured to indicate the reliability of the questionnaire (CVI>CVR/0.84>0.56). The first facet of the study comprises 15 computer teachers as judges; the second uses 21 criteria related to measurements of the web-sites; the third and final facet is the 14 web-sites prepared by students. The research results show that the most highly qualified web-site is *web-site-1*; the lowest qualified is *web-site-7*. J(udge) 14 and J13 are the most lenient while J8 and J7 are the most severe. The 15th item is the most difficult item to realize while the 7th item is the easiest. The results suggest that more studies of a higher quality may be produced if the students are given adequate support in their main field.
Keywords: web-site, evaluation, teachers' views, Rasch measurement model.

INTRODUCTION

With rapid developments in technology there are many changes and innovations in the field of education. Realization of these changes and developments depend on many factors. One of the most important of these is the ability to benefit from technology because, with technology, teaching and evaluation can be made more productive. For this reason information technologies in educational institutions have constituted an indispensable side of education. Mythily, Qiu and Winslow (2008) stated that the usage of the internet, which has become a part of daily life, has started to be used by individuals at a very early age by means of computers available in homes in recent years. It is obvious that the internet, which is an output of technological development, is one of the most important instruments in the spreading and sharing of information (Şahin, Balta & Ercan, 2010). Variety and quick spread of information, increases student-teacher rapport (Mythily, Qiu & Winslow, 2008) and enhances opportunities to speak foreign languages (Aydın, 2007); these are some of the great advantages of the internet. Moreover, internet access to information is both economical and fast. The internet's use is widespread in the field of education and it is an important source in terms of education and consequently the necessity of web-usage for students has increased (Ely, 2009; cited in Özad & Kutoğlu, 2010; Ramayah, 2010; Ardito *et al*., 2006; Romero & Marin, 2008).

With developing technology, most students at home and at school spend a large amount of their time using computers (Muslu & Bolışık, 2009). Instant and easy access to the needed information (Cantelmi & Talli, 2009; Unwin, 2008) or sharing of intense information on the web in internet environments creates effective and flexible learning environments (Khan, 2004). Web technology, which removes the requirement to be instructed at a certain time and place, and presents instead education opportunities at a place and time convenient for students is one of the major advantages provided by technology (Serio, 2003). Learning realized in this way, along with an increasing self-determination in the student, provides an effective and productive education experience (Semrádová & Klímová, 2008). Learning is made attractive by rich auditory and visual designs and provides savings in education expenditures (Maeda, 2002); these are other reasons why web technology is so commonly preferred by students. The usage of the internet which has a facilitating role in life, has become a habit particularly taken up by students (Arnas, 2005), affects them at home, school, outside and everywhere in recent times (Arısoy, 2009; Canbaz *et al.,* 2009). Young people use the internet for studying, writing and

searching, and also for different purposes such as playing games, listening to music (Muslu & Bolışık, 2009) chatting and e-mailing (Arnas, 2005).

Web usage is an indicator of development and has positive effects on individuals' lives. Besides its advantages, however, intense usage can bring about negative consequences. Dertousoz (2005, cited in Arnas, 2005) points out there is a slowdown in the creative and mental skills of students who spend a lot of time using computers and Healy (1998) reports a decrease in reading ability (cited in Arnas, 2005). Students may connect to the internet with the intention of doing homework, but instead chat or spend a lot of time on other internet distractions, ignoring the lesson (MEB, 2008). Problems of socialization may also occur (Korkmaz & Mahiroğlu, 2007). Information technology lessons given in schools with the purpose of removing or at least reducing these negative effects may be given within the framework of a determined plan and program and with the assistance of teachers who are experts in their field; students' productive skills thus may be even further developed**.** In this sense, students can be provided with the means to produce authentic, individual and useful outputs by structuring technological information which they own within the framework of attainments in curriculum. Abdullah, Abidin, Luan, Majid and Atan (2006) stated that schools cannot resist developments in technology; instead they exploit advances in technology by directing it towards ways of helping students to improve themselves. As a result, information technology which fills every part of life in this way is taught in schools as an inseparable part of the education environment. In this context, this research has been designed to examine students' involvement in information technology, evaluating their web-site preparation studies which are given to them as homework, and thus evaluating their web-usage proficiency.

The Purpose of the Research

The purpose of this research is to analyze web-sites prepared by students in the computer departments of vocational high schools using the many-facets Rash measurement model. In accordance with this purpose the following sub-aims have been included:

1. to perform a general analysis of views towards web-sites prepared by students in the computer departments of vocational high schools,
2. to analyse the judges' perceptions in terms of their severity or leniency,
3. to analyse the difficulty of assessing items in the questionnaire related to the students' web-sites, and
4. to analyse any bias on the part of the judges.

Method

Working Group

The research working group comprises 15 computer teachers working in a variety of high schools in Elazığ city center/Turkey during the 2011–2012 academic year. Teachers taking part in the research have taught every aspect of the lessons of related classes. The students whose web-site assignments have been evaluated comprise 14 students studying web design in the computer department of 100th Year Anatolian Technical and Vocational High School in Elazığ city center during the 2011–2012 academic year.

Research Data and Analysis

A survey approach has been adopted in the study. To evaluate students' web-sites the preparation of which have been given as homework the "Students' Web-Site Assignments Evaluation Form" developed by the researcher has been used. The analysis focuses on measuring

1) the success and suitability of prepared web-sites;
2) judges' severity/leniency and suitability and
3) the difficulty levels and suitability of items contained in the Students Web-Site Assignments Evaluation Form.

With the help of a literature review and experts' views (who comprise 1 Associate Professor, 2 Assistant Professors, 1 computer teacher who attended a PhD program in the field of curriculum and instruction, 2 computer teachers studying a master degree, 2 Turkish teachers, 4 computer teachers) an evaluation form has been prepared to collect the data. The questionnaire included a five-point Likert type scale with five options, namely, 'strongly disagree'; 'disagree'; 'undecided'; 'agree'; and 'strongly agree'. The analysis of the data which is related to the teachers' views about web-sites prepared by the students has been performed using the FACETS analysis program in which the Rasch measurement model described by Linacre (1993; 2008) was used. The content validity ratios (CVRs) of the 21 items related to the evaluation of student assignments are provided in Table 1.

Table 1: Content validity ratios (CVRs) of items related to the evaluation of student web-site assignments

Item Num.	Sub-Prob.	ITEMS	N_N	CVR	
1	AI	Site has been designed with content suitable for the purpose.	12	1.00	N_N: Number of experts thinking the items *necessary*
2		Many fields of subject are included in site content.	10	0.67	Content Validity Criterion : 0.56 Content Validity Indice : 0.841
3		Site's purpose is clear and obvious.	12	1.00	[(0.84>0.56) CVI> CVC]
4	CON	There is ease of access to the links.	10	0.67	
5		Content of the site is visually rich.	11	0.83	
6		Site has the feature of updating systematically.	11	0.83	
7		Site is attractive and enjoyable.	12	1.00	
8		Site's content is valid.	11	0.83	
9	DES	Site's text is readable.	12	1.00	
10		When an error is made it provides instant feedback.	10	0.67	
11		Visuals such as tables, figures, photos etc. are prepared with high-quality designs.	11	0.83	
12		Site has been designed with suitable colours.	11	0.83	
13		Site has been prepared with a phon suitable to every subject.	10	0.67	
14		Site has been designed to resist threats.	10	0.67	
15	ACC	Site presents ease of access to menu and other functions.	12	1.00	
16		Speed of downloading page is high.	10	0.67	
17		Site presents interactive online environments.	12	1.00	
18	EDU	Site is highly instructive.	12	1.00	
19		Site increases motivation of users.	12	1.00	
20		Site has been designed to develop social skills and communication.	10	0.67	
21		Level of site is appropriate to its users.	11	0.83	
Number of experts : 12					
SUB-TITLE ABBREVIATIONS :**AI**: AIM, **CON**: CONTENT , **DES**: DESİGN , **ACC**: ACCESS, **EDU**: EDUCATIONAL					

Content validity ratios (CVRs) were developed by Lawshe (1975) and are sometimes known as the Lawshe technic (cited in Yurdugül, 2005). The items' content validity indices (CVIs) which have been determined as criterion for content validity ratios, has been found to be 0.84. As this value is larger than the 0.56 content validity criterion (CVC) [(0.84>0.56) (CVI>CVC)], it can be said that the content validity of items in the questionnaire are statistically significant at the 0.05 level (Veneziano and Hooper 1997). The criteria, determined by the CVR, have been graded from the weakest (1) to the strongest (5).

Findings

Figure 1 shows the results of the data analysis. Separate columns are used to list the results relating to the evaluation of web sites, namely, web-site assignments, prepared by the students; judges; and items. It can been seen that J(udge) 8 has the most severe and J14 the most lenient behaviour. Generally it can be noted that judges have different scoring characteristics from each other. When the "web-site assignments" column is examined, it can be seen that the most successful assignment, according to the judges, is *web-site 1* followed by web-*sites 4* and *5*. The assignments evaluated as the most unsuccessful are web-*sites 7* and *12*.

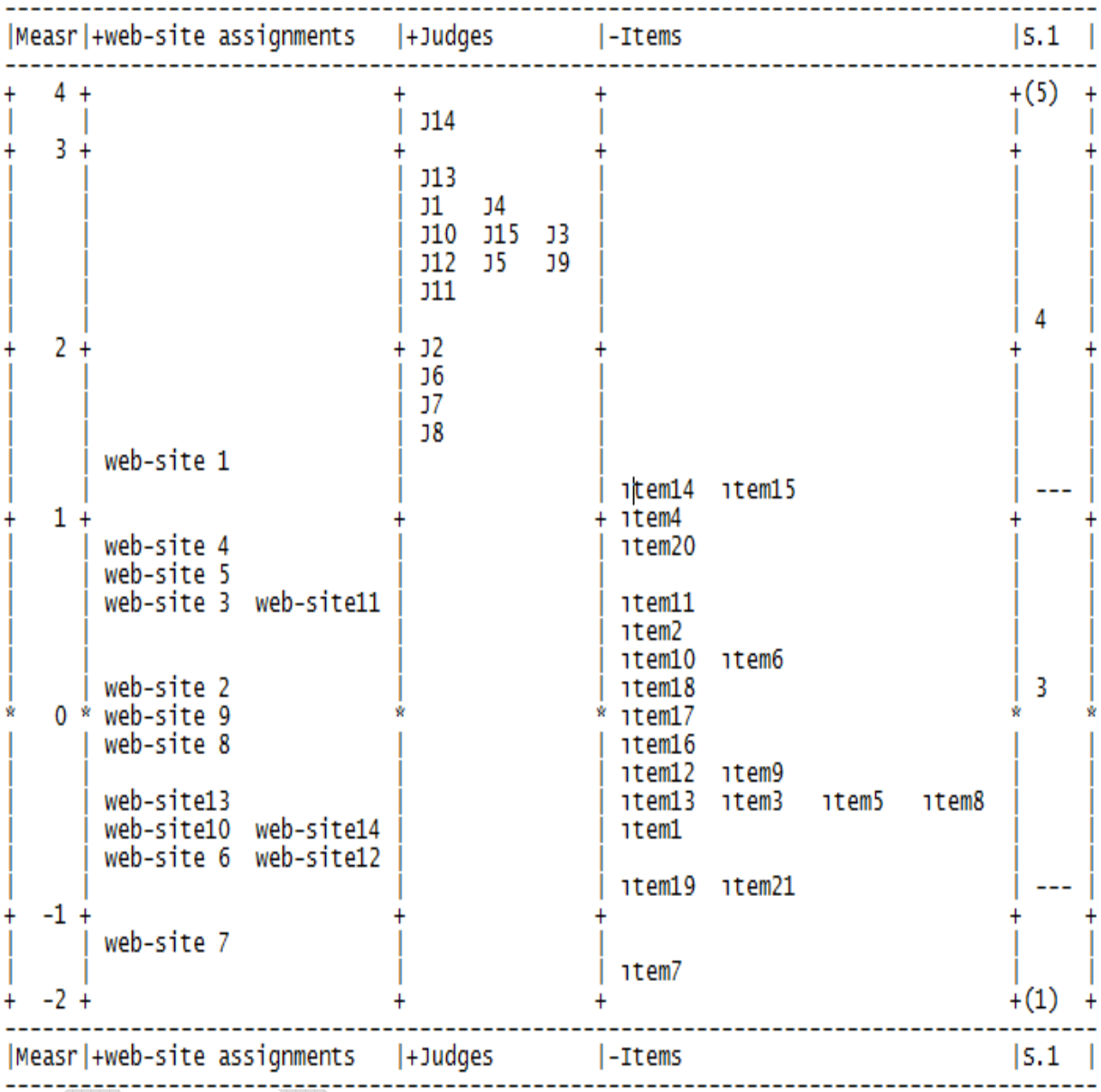

Figure 1: Data calibration map

When the column in which items used to evaluate web-site assignments prepared by the students is examined in Figure 1, the items with which students encountered most difficulty are *item14*: "Site has been designed to resist threats", and *item15*: "Site presents ease of access to menu and other functions" items. The item done most easily by students is *item7*: "Site is attractive and enjoyable".

Web-site Assignments

In Table 2, information prepared by students about their web-site assignments is presented comprehensively; their qualities have been ranked from the most to the least successful. The study which is at the highest level is web-*site1* and the assignment which has the lowest quality is web-*site*7. In addition to this, when looking at the "items" column which has been used to evaluate web-sites, it has been determined that the standard error (RMSE: Root Mean Square Standard Error) value belonging to logit values related to qualities of the assignments is 0.09. According to Baştürk (2010) RMSE shows the measurement error of all the data except those from values located in extreme limits. The standard error of 0.09 calculated in this study is quite low. The standard deviation of 0.63, which has been corrected by considering this error ratio, has been found to lie under the critical value of 1.0.

Table 2: Web-site assignments measurement report

Obsvd Score	Obsvd Count	Obsvd Average	Fair Avrage	Model Measure	Model S.E.	Infit MnSq	Infit ZStd	Outfit MnSq	Outfit ZStd	web-site Nu	web-site Assignments
1440	315	4.6	4.62	1.21	.10	1.2	2	1.2	1	1	web-site 1
1405	315	4.5	4.51	.87	.10	1.0	0	1.0	0	4	web-site 4
1371	315	4.4	4.39	.58	.09	1.0	0	1.0	0	5	web-site 5
1367	315	4.3	4.38	.55	.09	0.9	0	0.9	0	3	web-site 3
1357	315	4.3	4.35	.47	.09	0.6	-5	0.6	-5	11	web-site11
1313	315	4.2	4.20	.14	.08	0.7	-3	0.7	-3	2	web-site 2
1294	315	4.1	4.14	.00	.08	0.9	-1	0.9	-1	9	web-site 9
1278	315	4.1	4.08	-.11	.08	0.9	0	0.9	0	8	web-site 8
1230	315	3.9	3.92	-.43	.08	1.2	2	1.2	2	13	web-site13
1226	315	3.9	3.91	-.46	.08	1.2	2	1.2	2	14	web-site14
1222	315	3.9	3.89	-.48	.08	1.2	2	1.2	2	10	web-site10
1206	315	3.8	3.84	-.58	.08	1.1	1	1.1	1	6	web-site 6
1192	315	3.8	3.79	-.67	.08	1.5	5	1.5	5	12	web-site12
1128	315	3.6	3.58	-1.07	.08	0.6	-6	0.6	-6	7	web-site 7
1287.8	315.0	4.1	4.11	.00	.09	1.0	-0.1	1.0	-0.2	Mean (Count: 14)	
88.1	0.0	0.3	0.29	.64	.01	0.2	3.2	0.2	3.2	S.D.	

RMSE (Model) .09 Adj S.D. .63 Separation 7.35 Reliability .98
Fixed (all same) chi-square: 724.1 d.f.: 13 significance: .00
Random (normal) chi-square: 13.0 d.f.: 12 significance: .37

Reliability calculations using the Rasch analysis are interpreted post-calculation as in KR–20 or Cronbach's Alpha (Baştürk, 2010). The reliability co-efficient shows with which reliability students' web-sites quality rankings have been obtained. A co-efficient of 0.98 indicates that the ranking of students' assignments according to their qualities have been obtained with quite a high reliability. The separation index is 7.35; following this result, it can be said that students' assignments show statistically significant differences from each other in terms of quality: ($\chi 2$ =724.1, sd = 13, p = 0.00).

The Rasch analysis also gives "infit" and "outfit" statistical values related to the facets. The quality control limit stated for both values is between the range of 0.6–1.4 (Wright & Linacre, 1994, cited in Baştürk, 2010). The infit index is a value which shows sensibility to unexpected answers at the point of decision-making whereas the outfit index is a value which shows sensibility to unexpected answers which are outlier (Baştürk, 2010). When Table 2 is examined, the value which exceeded the determined limit for both indices (1.5) is that of web-*site12*. In this case it can be concluded that the infit and outfit values for every assignment lie between the quality control values and therefore can be accepted as suitable.

Analysis of Judges

Table 3 presents information about the scores judges have given to web-sites prepared by students. When judges are ranked from the severest to the most lenient, J8 is the most severe and J14 is the most lenient. Except from the values located in extreme limits, the standard error (RMSE) relating to the judges' severity/ leniency is the calculated value that includes all the data error measurements; at 0.09 this standard error is quite low. The standard deviation, at 0.38, corrected considering this error ratio, has been found to lie under the critical value of 1.0. The reliability co-efficient related to the judges' scoring behaviours has been calculated as 0.95, demonstrating that the judges' scoring behaviours have been realized with quite a high reliability.

As Table 3 shows, the Judge Separation Index is determined as 4.31 and the reliability co-efficient as 0.95. From this it can be concluded that judges show statistically significant differences between each other in terms of degrees of severity/leniency ($\chi 2$=289,9 sd =14, p=0.00).

Table 3: Judges' measurement report

Obsvd Score	Obsvd Count	Obsvd Average	Fair Avrage	Model Measure	Model S.E.	Infit MnSq	Infit ZStd	Outfit MnSq	Outfit ZStd	Nu	Judges
1302	294	4.4	4.49	3.18	.10	1.0	0	1.0	0	14	J14
1257	294	4.3	4.33	2.78	.09	0.9	0	0.9	0	13	J13
1239	294	4.2	4.26	2.63	.09	0.9	-1	0.9	-1	4	J4
1233	294	4.2	4.24	2.58	.09	1.0	0	0.9	-1	1	J1
1224	294	4.2	4.21	2.51	.09	0.8	-2	0.8	-2	15	J15
1217	294	4.1	4.18	2.45	.09	0.9	-1	0.9	-1	10	J10
1216	294	4.1	4.18	2.44	.09	0.8	-2	0.8	-2	3	J3
1214	294	4.1	4.17	2.43	.09	0.9	-1	0.9	-1	12	J12
1203	294	4.1	4.13	2.34	.09	0.9	0	0.9	-1	9	J9
1201	294	4.1	4.13	2.33	.09	1.3	3	1.2	2	5	J5
1198	294	4.1	4.11	2.30	.09	1.1	1	1.0	0	11	J11
1162	294	4.0	3.98	2.04	.09	0.9	-1	0.9	-1	2	J2
1141	294	3.9	3.90	1.89	.08	1.1	1	1.2	2	6	J6
1125	294	3.8	3.85	1.78	.08	1.3	3	1.3	3	7	J7
1097	294	3.7	3.74	1.58	.08	1.2	2	1.2	2	8	J8
1201.9	294.0	4.1	4.13	2.35	.09	1.0	0.0	1.0	-0.1	Mean (Count: 15)	
50.8	0.0	0.2	0.19	.39	.00	0.1	1.7	0.2	2.0	S.D.	

RMSE (Model) .09 Adj S.D. .38 Separation 4.31 Reliability .95
Fixed (all same) chi-square: 289.9 d.f.: 14 significance: .00
Random (normal) chi-square: 14.0 d.f.: 13 significance: .38

When "infit" and "outfit" statistical values related to the facets are examined, it has been determined that the infit and outfit point values of all judges fall between the determined range 1.4 – 0.6. It can be said therefore that all the judges' infit and oufit values lie within the expected quality control values and can be accepted as suitable. In other words, judges have shown coherent scoring behaviours in their evaluations of web-site assignments prepared by students.

Table 4: The analysis of items used to evaluate web-site assignments

Obsvd Score	Obsvd Count	Obsvd Average	Fair Avrage	Model Measure	Model S.E.	Infit MnSq	Infit ZStd	Outfit MnSq	Outfit ZStd	Nu	Items
747	210	3.6	3.56	1.12	.10	1.2	2	1.2	2	15	ıtem15
750	210	3.6	3.57	1.09	.10	1.0	0	1.0	0	14	ıtem14
756	210	3.6	3.60	1.04	.10	1.3	2	1.3	2	4	ıtem4
771	210	3.7	3.68	.90	.10	1.1	1	1.1	1	20	ıtem20
817	210	3.9	3.91	.46	.10	0.9	0	0.9	0	11	ıtem11
830	210	4.0	3.97	.33	.10	0.7	-3	0.7	-3	2	ıtem2
832	210	4.0	3.98	.31	.10	0.9	-1	0.9	0	6	ıtem6
834	210	4.0	3.99	.29	.10	0.9	-1	0.9	-1	10	ıtem10
847	210	4.0	4.06	.16	.10	0.9	-1	0.8	-1	18	ıtem18
857	210	4.1	4.11	.06	.10	1.0	0	1.0	0	17	ıtem17
870	210	4.1	4.17	-.08	.10	1.0	0	0.9	0	16	ıtem16
889	210	4.2	4.27	-.29	.11	0.9	0	0.9	0	12	ıtem12
890	210	4.2	4.27	-.30	.11	1.2	2	1.2	2	9	ıtem9
896	210	4.3	4.30	-.36	.11	0.9	-1	0.9	-1	5	ıtem5
897	210	4.3	4.31	-.38	.11	1.0	0	1.0	0	13	ıtem13
898	210	4.3	4.31	-.39	.11	0.9	0	0.9	-1	3	ıtem3
902	210	4.3	4.33	-.43	.11	1.0	0	1.0	0	8	ıtem8
907	210	4.3	4.36	-.49	.11	1.1	0	1.1	0	1	ıtem1
935	210	4.5	4.50	-.85	.12	1.1	0	1.0	0	21	ıtem21
940	210	4.5	4.52	-.91	.12	1.2	2	1.2	1	19	ıtem19
964	210	4.6	4.63	-1.27	.13	1.0	0	1.0	0	7	ıtem7
858.5	210.0	4.1	4.11	.00	.10	1.0	0.1	1.0	-0.1	Mean (Count: 21)	
62.0	0.0	0.3	0.31	.66	.01	0.1	1.5	0.1	1.5	S.D.	

RMSE (Model) .11 Adj S.D. .65 Separation 6.17 Reliability .97
Fixed (all same) chi-square: 805.1 d.f.: 20 significance: .00
Random (normal) chi-square: 20.0 d.f.: 19 significance: .40

The information about whether or not the items used to evaluate students' skills in preparing their web-site are suitable for purpose are presented comprehensively in Table 4. The table reveals that the items in which students seem to be the weakest when preparing their web-sites fall under the sub-title of *Access:* "Site presents ease of access to menu and other functions" and also, under the sub-title of *Design:* "Site has been designed to resist threats". Items which students find the easiest fall under the sub-title of Content: "Site is attractive and enjoyable" and also, under the sub-title of *Educational side:* "Site increases motivation of users".

The Standard Error (RMSE), relating to the analysis of the items used to evaluate web-site assignments is 0.11; this value shows that the Standard Error related to quality determination is quite low. The standard deviation of 0.65, corrected by considering this error ratio, lies under the critical value of 1.0, whereas the reliability co-efficient used to evaluate student assignments has been calculated as 0.97. This shows that items are quite reliable in determining students' skills in preparing their web-sites.

The Separation Index of 6.17 and the Reliability Co-efficent of 0.97 (Table 4) imply that the items used to determine the quality of the web-sites show significant differences in terms of difficulty ($\chi 2 = 805{,}1$ sd = 20, p = 0.00). When "infit" and "outfit" values related to facets on the table of item analysis are examined, none of the infit or outfit data exceeded their limit values. This result suggests that all items are coherent whilst also measuring students' skills related to preparation of the assignments. In other words, all the items have acceptable usage characteristics and all infit and outfit squares averages fell within their expected values.

Table 5: Judges' bias interaction analysis

Obsvd Score	Exp. Score	Obsvd Count	Obs-Exp Average	Bias+ Model Measure	S.E.	Z-Score	Infit MnSq	Outfit MnSq	Sq	Nu	web-site assignments	measr	Nu	Judg	measr
78	90.1	21	-.58	1.22	.31	3.99	0.6	0.6	195	13	web-site13	-.43	14	J14	3.18
71	82.5	21	-.55	1.07	.30	3.54	0.6	0.6	38	10	web-site10	-.48	3	J3	2.44
68	79.4	21	-.54	1.06	.31	3.46	0.9	0.9	92	8	web-site 8	-.11	7	J7	1.78
70	81.2	21	-.53	1.04	.30	3.41	0.6	0.6	208	12	web-site12	-.67	15	J15	2.51
82	91.4	21	-.45	1.00	.31	3.21	1.2	1.2	61	5	web-site 5	.58	5	J5	2.33
81	90.5	21	-.45	.98	.31	3.18	1.3	1.3	99	1	web-site 1	1.21	8	J8	1.58
78	87.5	21	-.45	.93	.31	3.06	0.4	0.4	8	8	web-site 8	-.11	1	J1	2.58
69	79.0	21	-.48	.93	.30	3.05	2.2	2.2	152	12	web-site12	-.67	11	J11	2.30
85	93.0	21	-.38	.90	.32	2.83	1.5	1.6	71	1	web-site 1	1.21	6	J6	1.89
79	87.2	21	-.39	.80	.31	2.62	1.2	1.2	163	9	web-site 9	.00	12	J12	2.43
72	80.2	21	-.39	.76	.30	2.52	1.5	1.5	62	6	web-site 6	-.58	5	J5	2.33
81	88.4	21	-.35	.75	.31	2.42	0.4	0.4	156	2	web-site 2	.14	12	J12	2.43
85	92.0	21	-.33	.77	.32	2.42	0.8	0.8	207	11	web-site11	.47	15	J15	2.51
79	86.5	21	-.35	.73	.31	2.38	1.2	1.2	89	5	web-site 5	.58	7	J7	1.78
74	81.5	21	-.35	.70	.30	2.29	1.0	1.0	34	6	web-site 6	-.58	3	J3	2.44
73	80.4	21	-.35	.69	.30	2.26	1.0	1.0	118	6	web-site 6	-.58	9	J9	2.34
77	84.2	21	-.34	.68	.30	2.24	0.9	0.9	14	14	web-site14	-.46	1	J1	2.58
84	90.2	21	-.29	.65	.31	2.08	1.1	1.2	74	4	web-site 4	.87	6	J6	1.89
72	78.8	21	-.32	.63	.30	2.07	1.6	1.7	27	13	web-site13	-.43	2	J2	2.04
81	87.4	21	-.30	.64	.31	2.07	1.2	1.2	102	4	web-site 4	.87	8	J8	1.58
68	74.7	21	-.32	.62	.31	2.04	0.9	0.9	147	7	web-site 7	-1.07	11	J11	2.30
81	87.2	21	-.30	.62	.31	2.01	1.6	1.6	73	3	web-site 3	.55	6	J6	1.89
96	89.9	21	.29	-.80	.40	-2.03	1.0	1.2	196	14	web-site14	-.46	14	J14	3.18
100	94.1	21	.28	-1.04	.49	-2.11	0.8	0.7	15	1	web-site 1	1.21	2	J2	2.04
82	75.0	21	.33	-.66	.31	-2.12	0.6	0.6	63	7	web-site 7	-1.07	5	J5	2.33
74	66.9	21	.34	-.66	.30	-2.16	0.8	0.8	105	7	web-site 7	-1.07	8	J8	1.58
97	90.5	21	.31	-.90	.41	-2.17	0.5	0.4	67	11	web-site11	.47	5	J5	2.33
82	74.6	21	.35	-.70	.31	-2.25	1.1	1.1	82	12	web-site12	-.67	6	J6	1.89
94	86.9	21	.34	-.84	.37	-2.27	0.8	0.8	204	8	web-site 8	-.11	15	J15	2.51
86	78.2	21	.37	-.76	.32	-2.36	0.4	0.5	49	7	web-site 7	-1.07	4	J4	2.63
82	73.9	21	.39	-.76	.31	-2.45	1.1	1.1	111	13	web-site13	-.43	8	J8	1.58
97	88.7	21	.39	-1.09	.41	-2.65	1.0	1.1	188	6	web-site 6	-.58	14	J14	3.18
95	86.2	21	.42	-1.04	.38	-2.74	0.8	0.9	36	8	web-site 8	-.11	3	J3	2.44
91	80.0	21	.52	-1.13	.34	-3.30	1.0	1.0	146	6	web-site 6	-.58	11	J11	2.30
95	82.8	21	.58	-1.38	.38	-3.63	0.4	0.5	6	6	web-site 6	-.58	1	J1	2.58
86	73.3	21	.60	-1.21	.32	-3.76	1.3	1.2	96	12	web-site12	-.67	7	J7	1.78
92	76.0	21	.76	-1.63	.35	-4.64	0.5	0.6	97	13	web-site13	-.43	7	J7	1.78
Obsvd Score	Exp. Score	Obsvd Count	Obs-Exp Average	Bias+ Model Measure	S.E.	Z-Score	Infit MnSq	Outfit MnSq	Sq	Nu	web-site assignments	measr	Nu	Judg	measr
85.9	85.9	21.0	.00	-.03	.34	-.01	0.9	0.9	Mean (Count: 210)						
8.3	6.9	0.0	.22	.50	.05	1.49	0.9	0.4	S.D.						

Fixed (all = 0) chi-square: 466.7 d.f.: 210 significance: .00

Table 5 provides results of the analysis of the judges' bias. Z points lying outside +2 and -2 is a sign of interaction bias (Semerci, 2011). Table 5 shows that Z points vary between 3.99 and -4.64, demonstrating that judges made extremely severe or lenient evaluations of students' web-site assignments. In interaction analysis made by judges about the assignments, J14 gave 78 points to *web-site13* (Z=3.99) instead of giving the necessary 90 points and the same judge awarded 96 points (Z=-2.03) to *web-site14* instead of 90 points; this judge gave 97 points (Z=-2.65) to *web-site* 6 instead of 89 points thus showing both positive and negative biases. It can therefore be concluded that judges have shown both positive and negative biases regarding the assignments of students. Semerci (2011) states that there may be many reasons for these biases; the Rasch measurement model draws attention to the sources and perpetrators of these biases but investigations to reveal the reasons for these biases are left to the researchers.

Conclusions

This research has used the many-facets Rasch measurement model to provide an analysis of data related to web-site assignments prepared by students. The Rasch analysis has revealed "infit" and "outfit" statistical values, related to the facets that lie between the range of 0.6 and 1.4 (Wright & Linacre, 1994, cited in Baştürk, 2010); this range defines the stated quality control limits. The only study which exceeds the limit determined for both indices is *web-site12*, with a value of 1.5. Judges showed statistically significant differences between each other in degrees of severity/leniency. All of the judges' scores relating to "infit" and "oufit" values are within the expected quality control values**.** All of the items used to determine the quality of the studies are of adequate quality to achieve the aim of the research. The item in which students are the weakest in terms of preparing web-sites is "Site presents ease of access to menu and other functions" and the easiest item is "Site is attractive and enjoyable". According to Baştürk (2010) the Rasch measurement model gives a reliability result which is equivalent to Cronbach's alpha reliability co-efficient. In other words, while the Rasch measurement model separates students' assignments according to their quality, as well as separating items according to their difficulty and easiness and separating judges according to their level of severity or leniency, it also gives the statistical value of the reliability of these operations. As in the traditional interpretation of reliability, in the Rasch model reliability increases as the reliability co-efficient approaches +1.00. In this research a reliability value of 0.98 has been obtained related to the quality determination of web-site assignments for which reliability co-efficients have been prepared; 0.97 has been obtained related to the quality determination of the items; and 0.95 has been obtained for determination of the judges' severity/leniency levels. It may be concluded that the many-facets Rasch measurement model can be used effectively in the evaluation of web-site assignments prepared by students. The results of this research demonstrate that students who prepare web-site assignments show differences in their skills when preparing their assignments. Thus it can be suggested that, to eliminate these differences, additional lessons and courses should be given to the students. Moreover, it has been concluded that some of the computer teachers, who are judges, displayed positively and negatively biased behaviours in scoring. For this reason, it is suggested that judges should pay more attention in the process of student evaluation.

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