# IDENTIFICATION AND CLASSIFICATION SYSTEM OF STUDENTS' TALENTS AND INTERESTS IN DISTANCE EDUCATION USING SOFT COMPUTING

## Fatia Fatimah

Department of Mathematics, Universitas Terbuka (INDONESIA) fatia@ecampus.ut.ac.id

#### Abstract

Distance education students have diverse ages, jobs, and domicile characteristics. Therefore, distance higher education faces challenges in developing policies according to students' needs and characteristics. Distance higher education needs a system that can analyze talents and interests so that students and campuses get references in making decisions. Universitas Terbuka has more than 400 thousand students and requires extensive data analysis to provide targeted services for all parties. This article aims to create a model for identifying and classifying the talents and interests of distance education students using soft computing. In the experiment phase, we applied the model to new students at the Universitas Terbuka Padang, Indonesia. Finally, the results obtained recommendations for talent and interest management systems based on model accuracy and challenges that need to be anticipated immediately by policymakers.

Keywords: classification, talent and interest, distance education, soft computing

## **1 INTRODUCTION**

Identification and development of student talents in distance education is currently not optimal. The process of implementing selection and coaching in channeling student potential is a challenge in itself for distance education universities.

The Open University, as a pioneer of distance education in Indonesia, has students spread throughout the country and abroad. Currently, in the odd 2023/2024 semester, the number of UT students has reached more than 500,000 people. This is an extraordinary achievement, so optimizing services, especially for students, is necessary. UT always holds student activities at local, national, and international levels. However, the obstacle regional UTs face, especially UT Padang, is detecting student activities under students' dominant potential and talents per region.

Meanwhile, as we know, each individual has diverse intelligence (Gardner & Hatch, 1989), known as Multiple Intelligences (MI). Knowledge about a person's dominant intelligence has been widely applied in various fields, including psychology, neuroscience, and genetics (Davis, Christodoulou, Seider & Gardner, 2011), organizations or companies (Pynes, 2008), and the implementation of MI in higher education (Kezar, 2001; Visser, Ashton & Vernon, 2006). Universitas Terbuka is expected to have a soft computing-based application to detect and classify student intelligence based on region and faculty.

N-soft set is part of soft computing (Fatimah, Rosadi, Hakim, & Alcantud, 2018). This is because the N-soft set can facilitate various types of assessment data. N-soft set also allows researchers in the same field and across fields to develop new ideas for existing definitions and implement them in various studies. The application of N-soft sets in overcoming various decision-making problems is shown in the following research: N-soft sets for incomplete data (Fatimah, 2018), big data (Fatimah, 2021a, 2021b), parameter reduction (Akram, Ali, Alcantud, & Fatimah, 2020), tourism (Fatimah, & Andriyansah, 2020), and voting (Fatimah, Rosadi, Hakim, Alcantud, 2017).

Therefore, this paper explains the development of a soft computing-based application, namely N-soft sets, which can be used for big data in identifying and classifying student intelligence.

## 2 METHODOLOGY

This research uses the development method. Development of applications based on soft computing algorithms, namely N-soft Sets in the TIA (Talent and Interest Allocation) application. The research population was new students from Universtas Terbuka Padang in the odd semester of 2023/2024. The sampling technique used is probability sampling. The research sample comprised new UT Padang students who took the interest and talent allocation test using the TIA application. Sample data was obtained from 227 students. The list of questionnaire questions is made based on Table 1.

	Table 1.	Variable Operational Definitions
Variable	Item	Question
(Intelligence	Code	
Type)		
Linguistics ( <b>a</b> )	<i>a</i> <sub>1</sub>	You like to read various writings: newspapers,
•	-	magazines, car brands, stickers on city
		transportation, and even product labels.
	<i>a</i> <sub>2</sub>	Two of the games that you like are Scrabble and
		TTS.
	<i>a</i> <sub>3</sub>	You are pretty confident and convincing when
		arguing with others.
	<i>a</i> <sub>4</sub>	You can provide clear and straightforward
		directions or explanations.
Mathematical	<b>b</b> <sub>1</sub>	Your daily activities are neatly arranged and
Logic ( <b>b</b> )		organized.
	<b>b</b> <sub>2</sub>	Logic games like chess and computer games
		require your preferred strategy.
	<b>b</b> <sub>3</sub>	When faced with a problem, you usually compile
		your steps.
	<i>b</i> <sub>4</sub>	You like to see or look for patterns of relationships
		between objects or between numbers.

Table 1. Variable Operational Definitions

Variable (Intelligence	Item Code	Question
Type) Musical ( <i>c</i> )	<i>c</i> <sub>1</sub>	While doing something, you like to hum or whistle.
	<i>c</i> <sub>2</sub>	Memorizing songs, especially the tunes, is very easy for you.
	<i>c</i> <sub>3</sub>	There are one or several musical instruments that you can play.
	<i>c</i> <sub>4</sub>	If music is playing, you can sing in the right notes.
Kinesthetic ( <b>d</b> )	<i>d</i> <sub>1</sub>	It is not enough just to see it to learn new things. You prefer to be able to do it yourself.
	<b>d</b> <sub>2</sub>	You like adventures that impress you are spectacular, and are physically demanding.
	<b>d</b> <sub>3</sub>	When exercising is an activity that you look forward to at school.
	<b>d</b> <sub>4</sub>	Solving a problem while moving: walking, running, or exercising is the right way and makes you more comfortable.
Interpersonal ( <i>e</i> )	<i>e</i> <sub>1</sub>	If there is a problem, you prefer to discuss it with others rather than think about it yourself.
	<i>e</i> <sub>2</sub>	You like to 'get together' with friends during your free time.
	<i>e</i> <sub>3</sub>	You like to direct other people to do something, and you like to be a leader.
	<i>e</i> <sub>4</sub>	You quite often help friends solve their problems.
Intrapersonal $(f)$	$f_1$	I am participating in self-development seminars that interest you.
	$f_2$	When holiday time comes, you imagine a comfortable place to be alone, to reflect, not too crowded and not in the city center.
	<i>f</i> <sub>3</sub>	You set your life goals and know where you are going
	f <sub>4</sub>	You prefer activities you can do alone rather than those involving many people.

 than those involving many people.

 This section explains the definition of N-soft sets and the algorithms to be used.

The universal set of objects is expressed by the notation U, E symbolizes the universal set of parameters or attributes with  $A \subseteq E$  dan an ordered set of ranks using the notation  $R = \{0, 1, ..., N - 1\}$  where  $N = \{2, 3, ...\}$ .

Definition 1. (Fatimah et al.al., 2018). Let U denote the universe of objects and Q h the set of attributes,  $A \subseteq Q$ . Let  $G = \{0, 1, ..., N - 1\}$  be a rank-ordered set with  $N \in \{2, 3, ...\}$ . The *N*-soft set over U, denoted by, is the result of the mapping  $F: A \to 2^{U \times G}$  for each  $q \in A$  exist singly contained  $(u, g_q) \in U \times G$  such that  $(u, g_q) \in F(q), u \in U, g_q \in G$ .

Let  $U = \{u_i \mid i = 1, 2, ..., m\}$  and  $A = \{q_j \mid j = 1, 2, ..., n\}$  is a finite set, so the N-soft set can be represented in tabular form, as shown in Table 2.

(F, A, N)	$q_1$	$q_2$		$q_n$			
$u_1$	$r_{11}$	<i>r</i> <sub>12</sub>		$r_{1n}$			
$u_2$	$r_{21}$	<i>r</i> <sub>22</sub>		$r_{2n}$			
$u_m$	$r_{m1}$	$r_{m2}$		r <sub>mn</sub>			
		Source: Fatimah et al. (2018)					

Table 2. N-Soft Set

#### **3** FINDINGS AND DISCUSSION

This research uses actual data from Universitas Terbuka Padang Students. Let  $U = \{u_i\}$  represent new students at Universitas Terbuka Padang in Odd Semester 2023/2024. Research data was taken in two locations, namely District 50 Cities and Bukittinggi, with different respondents. The total sample collected was 227 students with index i = 1, ..., 227. Let  $A = \{a, b, c, d, e, f\}$  States the type of intelligence, namely, a: linguistic, b: logical-mathematical, c: kinesthetic, d:musical, e:interpersonal, dan f:intrapersonal. The parameters for measuring each type of intelligence refer to Table 1. Students provide an assessment in the form of a rating  $R = \{0,1,2,3,4\}$  Namely "never" (0), "very rarely" (1), "sometimes" sometimes" (2), "often" (3), and "always" (4). So, it is known that N=5. The threshold (T) used in this example is the value  $r \ge 3$ . The Decision ( $k_A$ ) is obtained if 75% of the parameters in the intelligence group meet the threshold, then the student ( $u_i$ ) is categorized as having the type of intelligence according to that group.

Tables 3 to Table 5 present data from three students' entries as five soft sets denoted by (F, A, 5). when answering questions according to Table 1.

U		(	ı			b					
	<i>a</i> <sub>1</sub>	<i>a</i> <sub>2</sub>	<i>a</i> <sub>3</sub>	$a_4$	$b_1$	<i>b</i> <sub>2</sub>	$b_3$	$b_4$			
$u_1$	2	3	2	0	2	4	3	2			
<i>u</i> <sub>2</sub>	3	3	4	3	3	2	4	4			
$u_3$	3	2	3	1	1	4	4	2			
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $										

U		(			d			
	<i>c</i> <sub>1</sub>	<i>C</i> <sub>2</sub>	<i>C</i> <sub>3</sub>	<i>C</i> <sub>4</sub>	$d_1$	$d_2$	$d_3$	$d_4$
$u_1$	1	2	2	1	4	3	3	2
<i>u</i> <sub>2</sub>	2	3	4	1	1	1	2	3
$u_3$	3	0	4	2	3	3	2	2

Table 5. (F, e, 5) & (F, f, 5)

U		6	ç			f			
	$e_1$	$e_2$	$e_3$	$e_4$	$f_1$	$f_2$	$f_3$	$f_4$	
$u_1$	3	2	1	1	3	1	3	3	
$u_2$	3	3	3	2	3	3	2	2	
<i>u</i> <sub>3</sub>	3	2	3	2	3	3	4	3	

Because the threshold T = 3, then for  $r \ge 3$ , the conversion becomes one; otherwise, it is given a score of 0. Tables 6 to 8 present the conversion results of 5-soft sets, (F, A, 5)'.

Table 6. (F, a, 5)' & (F, b, 5)'

U			a	-	k <sub>a</sub>	b				k <sub>b</sub>
	<i>a</i> <sub>1</sub>	<i>a</i> <sub>2</sub>	<i>a</i> <sub>3</sub>	$a_4$		$b_1$	<i>b</i> <sub>2</sub>	<i>b</i> <sub>3</sub>	$b_4$	
$u_1$	0	1	0	0	25%	0	1	1	0	50%
$u_2$	1	1	1	1	100%	1	0	1	1	75%
$u_3$	1	0	1	0	50%	0	1	1	0	50%
	1		Та	ble 7. (1	F, c, 5)' &	& (F, d, !	5)'			
U		(	C		k <sub>c</sub>	<i>d</i>				k <sub>d</sub>
	<i>c</i> <sub>1</sub>	<i>c</i> <sub>2</sub>	<i>C</i> <sub>3</sub>	<i>C</i> <sub>4</sub>		$d_1$	$d_2$	$d_3$	$d_4$	
$u_1$	0	0	0	0	0%	1	1	1	0	75%
$u_2$	0	1	1	0	50%	0	0	0	1	25%
$u_3$	1	1	0	0	50%	1	0	1	0	50%

Table 8. (F, e, 5)' & (F, f, 5)'

U	е				k <sub>e</sub>	f				$k_f$
	$e_1$	<i>e</i> <sub>2</sub>	<i>e</i> <sub>3</sub>	$e_4$		$f_1$	$f_2$	$f_3$	$f_4$	
$u_1$	1	0	0	0	25%	1	0	1	1	75%
<i>u</i> <sub>2</sub>	1	1	1	0	75%	1	1	0	0	50%
$u_3$	1	0	1	0	50%	1	1	1	1	100%

So, the Decision is obtained based on the criteria $k_A \ge 75\%$ . Students who meet the criteria for a particular type of intelligence are marked  $\sqrt{}$ , and those who do not are given the symbol × (Table 9).

U	k <sub>a</sub>	k <sub>b</sub>	k <sub>c</sub>	k <sub>d</sub>	k <sub>e</sub>	k <sub>f</sub>
$u_1$	×	×	×	$\checkmark$	×	$\checkmark$
<i>u</i> <sub>2</sub>	$\checkmark$	$\checkmark$	×	×	$\checkmark$	×
<i>u</i> <sub>3</sub>	×	×	×	×	×	$\checkmark$

The calculation stages above were carried out for all samples, namely 227 students. The TIA application can calculate and display results automatically. Meanwhile, decision-makers can retrieve data according to the period for filling out the questionnaire. So, the TIA application is straightforward and valuable.

An example of a recapitulation of the intelligence test results for new UT Padang students in the 50 cities' regency and surrounding areas can be seen in Figure 1. A recapitulation of student dominants per type of intelligence can be seen in Figure 2.

PP 📃							
@ RE	PORT STATUS MAHASISWA U.	JIAN					Tanggal Cetak:30-09-202
Nim Sist	wa				Pilih Jadwal		
					РКВЈЈ		н -
Pilih Pro	ov				Pilih Kel		
Pilih				*	Pilith		
Pitih Kor	ta/Kabupaten				Pilih Fakultas		
Pilih				*	Pillh		
Pilih Keo	¢				Pilih Prodi		
< Pilih					Politi		
Pilih Kat							
< Pilih							
	and Commenced Incommenced						
	G Cetak PDF Export Excel						
Car List Jar	waban Siswa Pada Jadwal Ujian <b>PK</b>		09-17 Dengan Jumlah Siswa Sebanyak 140				
Car List Jan		BJJ / 2023-09-14 s/d 2023-4 Kategori Sosi	09-17 Dengan Jumlah Sisw <mark>t Sebanyak 140</mark> Goal			Jawaban	Stitul
Carl List Jan No 1	waban Siswa Pada Jadwal Ujian <b>PK</b>	Kategori Soal				Jawaban	Milai
No	waban Siswa Pada Jadwal Ujian PK		Bont				
No	waban Siswa Pada Jadwal Ujian PK	Kategori Soal	Soni Anda cukup percaya diri dan meyakinkan pada sa			2	0
No	waban Siswa Pada Jadwal Ujian PK	Kategori Soal	56el Anda cokup percaya diri dan meyakinkan pada sa Anda dapat memberikan penginahan atau penjela	asan ya	ing jelas dan lugas	2 3	0
No	waban Siswa Pada Jadwal Ujian PK	Kategori Soal	Book Anda cukup perceya diri dan meyakinkan pada sa Anda dagat memberikan penganahan atau pengel Berbagai fulisan suka anda baca; koran, majalah,	nork n	ing jelas dan lugas nobil, stiker di angkutan kota, bahkan label produk	2 3 2	0 1 0
No 1	waban Siswa Pada Jadwal Ujian PK Nama Mahasiawa SAHRUL / 05098728	Kategori Soal	56el Anda cokup percaya diri dan meyakinkan pada sa Anda dapat memberikan penginahan atau penjela	nork n	ng jelas dan lugas nobil, sliker di angkutan kota, bahkan label produk dan TTS	2 3	0
No	waban Siswa Pada Jadwal Ujian PK Nama Mahasiawa SAHRUL / 05098728	Kategori Soat	Book Anda cukup perceya diri dan meyakinkan pada sa Anda dagat memberikan perceja Berbagai fulisan suka anda baca; koran, majalah,	nork n	ing jelas dan lugas nobil, stiker di angkutan kota, bahkan label produk	2 3 2	0
No.	waban Siswa Pada Jadwal Ujian PK Nama Mahasiawa SAHRUL / 05098728	Kategori Soal	Goal Anda cutup percaya diri dan meyakinkan pada sa Anda dapat memohinkan pergarahan aku pergeb Bertinggal tersis saka anda basi yan pergarahan saku perkalakan Basih satu permatan yang anda sukar adatah sor	nork n rabble (	ing jelas dan kagas nobil, siliker di angkutan kota, bahkan label produk dan TTS 25 %	2 3 2 0	0 1 0
No 1	waban Siswa Pada Jadwal Ujian PK Nama Mahasiawa SAHRUL / 05098728	Kategori Soat	Exert Ande coluce percept der darn meyskelnkan pade as Ande daget membenkan pungsarban das perspet Bertagat fullsam stake andra basis, konzi, majake, Bah sahu permanan yang anda sukar adalah sor Permanan logika sepert calur, permanan konput	asan ya merk n rabble i đer yan	ng jolas dan kugas molol, siter di angkutan kota, bahkan label produk Ishn TTS 25 % g memerlukan strategi anda sukal	2 3 0 2	0 1 0
1	waban Siswa Pada Jadwal Ujian PK Nama Mahasiawa SAHRUL / 05098728	Kategori Soat	Soci Andra cakup percepti diri dan meyakinkan patita sa Andra dapat memberikan perganahan sitau pergita Berbagat teken saka andra basat, koran, majada, Badah satu permatian yang anda sukar adatah so Permatiana logika sepert cakur, permatiana kemput Kalau menyihaking sukur masadar, anda lisasanya	asan ya merk n rabble ( fer yan a menya	ng jalas dan tugas ondol, sikar di anglastan kola, bahkan label produk tan 1173 25 % g memerukukan stategi anda sukal usun tangkah-langkah yang akaa anda ambi	2 3 2 0 2 4	0 1 0 1
No 1	waban Siswa Pada Jadwal Ujian PK Nama Mahasiawa SAHRUL / 05098728	Kategori Soat	Exert Ande coluce percept der darn meyskelnkan pade as Ande daget membenkan pungsarban das perspet Bertagat fullsam stake andra basis, konzi, majake, Bah sahu permanan yang anda sukar adalah sor Permanan logika sepert calur, permanan konput	asan ya merk n rabble i fer yan a menya an tera	ng pista khapas khapas tan TTB 2000 g memolukan strangi anda sukai awa hangkah-hangkah yang akan anda antai km	2 3 0 2	0 1 0

Figure 1. Display of TIA Test Results for Students in 50 Districts and Surrounding Areas



Copyright © 2023 TIA (Talent and Interest Allocation)





An example of a recapitulation of the intelligence test results for new UT Padang students in the Bukittinggi City area and its surroundings can be seen in Figure 3. A recapitulation of dominant students per type of intelligence can be seen in Figure 4.

							64 🧶
0	REPORT STATUS MAHASISWA U	JJIAN					Tanggal Cetak:30-09
Nier	m Siswa				Pilih Jadwal		
					WTKU		
Pilif	ih Prov				Pilih Kel		
Pi	Pilih				Päih		
Pitit	ih Kota/Kabupaten				Pilih Fakultas		
Pi	Pilih				Pilib		
Pilit	ih Kec				Pilih Prodi		
< Pi	Pilih				Pilih		
	ih Kategori						
د Pi	Pilih						
	Cari Cetak PDF Export Excel						
List	st Jawaban Siswa Pada Jadwal Ujian <b>W</b>	TKU / 2023-09-23 s/d 2023	3-09-26 Dengan Jumlah Siswa <mark> Sebanyak 87</mark>				
	lo Nama Mahasiswa	TKU / 2023-09-23 s/d 2023 Kategori Soal	3-09-26 Dengan Jumlah Siswa <mark> Sebanyak 87</mark> Sosi			Jawaban	Nilai
Ne	io Nama Mahasiswa					Jawaban	Nilai
Ne	io Nama Mahasiswa	Kategori Soal		rabble	dan 175	Jawaban 3	Nital
Ne	io Nama Mahasiswa	Kategori Soal	Soat				
Ne	io Nama Mahasiswa	Kategori Soal	Sosi Salah satu permainan yang anda sukai adalah sor	aat ber	debat dengan orang lain	3	1
N	io Nama Mahasiswa	Kategori Soal	Soat Salah satu permainan yang anda sukai adalah sor Anda sukup percaya diri dan meyakirikan pada sa	sat ben , merk i	debat dengan orang lain mobil, stiker di angkutan kota, bahkan label produk	3	1
Nc 1	io Nama Mahasiswa	Kategori Soal	Solah satu permainan yang anda sukai adalah sor Anda cukap percaya din dan meyakinkan pada as Berbagai fuligan suka anda baca; koran, majatah,	sat ben , merk i	debat dengan orang lain mobil, stiker di angkutan kota, bahkan label produk	3 4 2	1 1 0
Nc 1	io Nama Mahasinwa vebiyola / 050019828	Kategori Soal	Solah satu permainan yang anda sukai adalah sor Anda cukap percaya din dan meyakinkan pada as Berbagai fuligan suka anda baca; koran, majatah,	sat ben , merk i	debat dengan orang lain mobil, stiker di angkutan kota, bahkan label produk ing jelas dan lugas	3 4 2	1 1 0
Nc 1	io Nama Mahasinwa vebiyola / 050019828	Kategori Soal	Solah satu permainan yang anda sukai adalah sor Anda cukap percaya din dan meyakinkan pada as Berbagai fuligan suka anda baca; koran, majatah,	aat ber , merk i asan yi	stehat dangan orang lain mobil, stiker di angkutan kota, bahkan label produk ang jelas dan lugas 75 %	3 4 2	1 1 0
No.	io Nama Mahasinwa vebiyola / 050019828	Kategori Soal	Solah Salah satu permainan yang anda sukar adalah sor Anda cukap pencaya diri dan meyakinkan pada sa Berbagai fulian suka anda baca, koran, majakih, Anda dagat memberikan pengarahan siku penjela	aat ber , merk i asan yi n antar	debat dengan onang lain mobil, stiker di angkutan kota, bahkan label produk mg pikia dan lugas 75 %	3 4 2 4	1 1 0 1
No.	io Nama Mahasinwa vebiyola / 050019828	Kategori Soal	Soat Soath satu permainan yang anda sukia sakah kor Anda cukup percaya diri dan meyakinkan pada sa Berbagai hulian suka anda biase, koran, majakih, Anda dapat memberikan penganahan atau penjata Anda senang melihat atau mencain jola hubungan Permainan tingka seperti atau, permainan koroput Kalau menghadapi suatu mesalah, anda biasenya	sat ben , merk i asan yi asan yi n antar uter yar a meny	dekat dengan orang lain motot, stear di angkutan kota, bahkan label produk mog jelas dan lugas 75 % odejek atau antar bitangan ug memufukan stateng landa sukal usun langkah-langkah yang akan anda ambil	3 4 2 4 1 1	1 0 1 0 0 0
Nc 1	io Nama Mahasinwa vebiyola / 050019828	Kategori Soal	Soil Soil Soil Soil Adds okaip percaya diri dan meyakrikan pada as Ardis okaip percaya diri dan meyakrikan pada as Betelagal fulfan akka anda basis konsi, majalah, Ardis dapat memberikan pengarahan atau penjela Ardis senang melihat atau mencain poli habungan Permainan logika segerti catur, pemainan komput	sat ben , merk i asan yi asan yi n antar uter yar a meny	dekat dengan orang lain motot, stear di angkutan kota, bahkan label produk mog jelas dan lugas 75 % odejek atau antar bitangan ug memufukan stateng landa sukal usun langkah-langkah yang akan anda ambil	3 4 2 4 2 1	1 1 0 1 0 0





Figure 4. Bukittinggi City and Surrounding Area Respondent Intelligence Group Students who have finished filling out the questionnaire on the TIA application can find out their respective intelligence types because the scores immediately appear (Fig. 5). These results are stored in the student's TIA application so they can be checked at any time.

M. Faris Attatih Murad	Detail F	listori Ujian						
	No	Judul	Tanggal Periode	Tanggal Mu	ital	Tanggal Selesal	Status	
	-	WTKU	2023-09-23 p/d 2023-09-26	2023-09-25		2023-09-25	Selesal	
	Kologo	ri Soat				Intrapersonal		
	Jumlah					4 Soal		
		rt Persentase Jav	vaban			75 %		
		ersentase Jawaba				100 %		
	< Hasil Al	khir			Memenuhi Hesil			
		ari Soal				Interpersonal		
	Jumlah				4 Soal			
		rt Persentase Jaw	vaban			4 8001 70 %		
	100000000000000000000000000000000000000	irsentase Jawaba			50 %			
	Hasil A	khir				Belum Memenuhi Hasil		
	Katara	ori Soal				Musikal		
	Jumlah			:		4 Goal		
		rt Persentase Jav	aban			75 %		
	Nilai Pe	ersentase Jawaba			0.56			
	Hasil A	khir			Belum Memenuhi Hasil			
	Kateor	ori Soal				Kinestetik		
	Jumlah					4 Soal		
		rt Persentase Jaw			75 %			
	Nilai Pe	arsentase Jawaba			25 %			
	Hasil A	khir		:		Belum Memenuhi Hasil		
	Katego	ri Soni				Logis Matamatis		
	Jumlah	Soal				4 Soal		
	Standa	rt Persentase Jaw			75 %			
	Nilai Pe	ersentase Jawaba			100 %			
	Hasil A	khir				Memenuhi Hasil		
	Katego	ri Soal		1		Linguistik		
	Jumlah	Soal		1		4 Soal		
		rt Persentase Jaw		1		75 76		
		arsentase Jawaba	e Aoda			75 %		

Figure 5. Display of TIA Results from Student Accounts

## 4 CONCLUSION

Universitas Terbuka, with a student population of half a million, must prepare support services to identify students' talents and interests. Identification and classification of student intelligence is an excellent opportunity for UT because it knows more about the characteristics of students per region. As a result, the activities carried out per region are right on target for students, effective according to achievement targets, and efficient in using funds. The TIA (Talent and Interest Allocation) application based on soft computing, especially N-Soft Sets, can be applied throughout UT Padang and even UT in other regions. The results obtained are accurate, and agents can immediately see their respective types of intelligence. Using the TIA application can also be an online exam simulation for new students.

#### ACKNOWLEDGEMENTS

We are grateful to Universitas Terbuka for providing financial support for our research. Their generous funding allowed us to conduct our study and complete our work.

#### REFERENCES

- Akram, M., Ali, G., Alcantud, J. C., & Fatimah, F. (2021). Parameter reductions in N-soft sets and their applications in decision-making. *Expert Systems*, 38(1). https://doi.org/10.1111/exsy.12601
- Davis, K., Christodoulou, J., Seider, S., & Gardner, H. E. (2011). The theory of multiple intelligences. Davis, K., Christodoulou, J., Seider, S., & Gardner, H.(2011). The theory of multiple intelligences. In RJ Sternberg & SB Kaufman (Eds.), Cambridge Handbook of Intelligence, 485-503.
- Fatimah, F., (2018). Book Chapter: Pengambilan keputusan incomplete N-Soft Sets pada data untuk mengukur indikator sustainable development goals. Judul Buku: Peran Matematika, Sains, dan Teknologi dalam Mencapai Tujuan Pembangunan Berkelanjutan, Universitas Terbuka, 209-228.
- Fatimah, F. (2021a). Book Chapter: N-Soft Sets: Tantangan dalam Riset Big Data. Judul Buku: Science and Technology for Society 5.0, Universitas Terbuka,1-23.
- Fatimah, F. (2021b). N-Soft Sets: Literature Review and Research Potential. In Conference Proceeding: The 1st International Seminar of Science and Technology for Society Development ISST 2021, 27-39.

- Fatimah, F., & Andriyansah (2020). Analisis Fasilitas Pariwisata Menggunakan Prosedur Pengambilan Keputusan N-Soft Set. Jurnal RESTI (Rekayasa Sistem Dan Teknologi Informasi), 4(1), 135-141.
- Fatimah, F., Rosadi, D., Hakim, R.B.F., & Alcantud, J. C. R. (2018). N-soft sets and their decision-making algorithms. Soft Computing, 2, 3829–3842. https://doi.org/10.1007/s00500-017-2838-6
- Fatimah, F., Rosadi, D., Hakim, RB. F., Alcantud, J. C. R. (2017). A Social Choice Approach to Graded Soft Sets, 2017 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), 1-6. doi: 10.1109/FUZZ-IEEE.2017.8015428.
- Gardner, H., & Hatch, T. (1989). Educational implications of the theory of multiple intelligences. Educational researcher, 18(8), 4-10.
- Kezar, A. (2001). Theory of multiple intelligences: Implications for higher education. Innovative Higher Education, 26, 141-154.
- Pynes, J. E. (2008). Human resources management for public and nonprofit organizations: A strategic approach (Vol. 30). John Wiley & Sons.