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Assessment Instrument for Special Needs Students (AISNS) Based on Invasion Category Games in Physical Education

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Abstract

The purpose of this study is to develop an Assessment Instrument for Special Needs Students (AISNS) based on invasion category games in Form Two Physical Education. The AISNS is develop based on the PDCA Cycle model (plan, do, check and act). The research design was one-shot case study conducted in 11 secondary schools which offered Special Education Integration Program in Kinta Utara, Perak. Sample of the study consisted of 17 Physical Education teachers and 65 Form 2 students. The validity of AISNS is r = 0.91, instrument reliability (r = 0.89), inter-rater objectivity (r = .96) and questionnaire reliability (α = .99). Descriptive data were analyzed using mean, standard deviation and percentage. Analysis using t-test showed that there is no significant difference in achievement of performance level by school category and gender. One-way ANOVA showed significant difference in achievement of performance level for handball ($p < .05$, $p = .006$) and touch rugby ($p < .05$, $p = .016$) according to the type of disability. Two-way ANOVA showed there is no main effects and interaction effects on type of disability and gender for handball (type*gender; $p = .750$) and touch rugby (type*gender; $p=.960$). Correlation analysis using Pearson Product Moment showed a very strong and significant relationship between achievement of performance level in invasion category game and the type of disability (autism; $r = 1.00$, $p = .000$), (intellectual disabilities; $r = .86$, p. = .000), (slow learner; $r = .96$, $p = .000$) (dyslexia; $r = 1.00$, $p = .000$). The AISNS is suitable for assessing the achievement of performance level . Using AISNS as an alternative instrument can produce students who are active, healthy, skilled, knowledgeable, able to socialize and practice a healthy lifestyle.

Keyword: Learning Assessment Instrument, Classroom Assessment, Physical Education, Special Needs Students, Invasion Category Games

Introduction

Education in Malaysia is an ongoing effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals, who are intellectually, spiritually, emotionally and physically balanced and harmonious, based on a

firm belief in and devotion to God (Curriculum Development Division, 2016). The statement quoted in the National Education Philosophy clearly shows the commitment by the government in its efforts to enhance the educational status.

The educational equality that is planned and implemented involves all students including special needs students (SNS). The statement can be referenced in the National Education Policy statements:

> Special education is designed to meet the educational needs of SNS who have been identified as having disabilities, hearing disabilities, learning problems, physical disabilities and various disabilities at the preschool, primary, secondary and post-secondary levels. Education for SNS is implemented in special education schools, Integrated Special Education Programs and Inclusive Education Programs. At the secondary level, the Ministry of Education (MOE) provides academic or vocational based education for SNS (Ministry of Education Malaysia, 2018).

The Integrated Special Education Program (ISEP) was introduced in 1962 for selected primary and secondary school. This program was created for several purposes. All SNS have the opportunity to receive relevant and appropriate educational access. In addition, all SNS have the opportunity to develop their talents and potential through vocational education to produce skilled people towards improving the quality of life. Students with special educational needs have the opportunity to participate in early intervention programme so that their ability level can be optimized. Finally, ISEP also provides an opportunity for SNS to participate in educational programs to produce highly skilled groups and potential SNS could join in the mainstream classes (Ministry of Education Malaysia, 2018).

The MOE has transformed the examination-oriented assessments into holistic, balanced, flexible, fair and refers to the standard. Classroom assessment not only assesses the cognitive intelligence but also includes the emotional intelligence, physical fitness and values and morals contained in the National Education Philosophy. In this regard, the Curriculum and Assessment Standard Documents for Primary School was implemented in 2011 and introduced the Curriculum and Assessment Standard Documents for Secondary School in 2017 (Ministry of Education Malaysia, 2013). This curriculum has applied classroom assessment to assess student learning.

The Objectives of the Study are as Folow:

- To determine the level of psychomotor, cognitive and affective achievement for special needs students by using the AISNS.
- To identify the differences in the achievement of the performance level between school category and gender by using the AISNS.
- Identify the differences in the achievement of the performance level according to the type of disability by using the AISNS.
- Identify the differences in the achievement of the performance level by using the AISNS between male and female students according to the type of disability.
- Analyze the relationship between the achievement of performance level and type of disability by using the AISNS.

Learning Assessment Issues in Physical Education (Special Education)

Based on the Preliminary Report of the Malaysia Education Development Plan (MEDP) 2013 - 2025, "the implementation of school-based assessment shows that teachers still do not fully understand and master the changes that have taken place" (Ministry of Education Malaysia, 2012b, p. 4-4). The findings of Arsaythamby et al. (2015) also showed that teachers are still unclear in various aspects of assessment including purpose, implementation time, implementation techniques, making observations, collecting, recording, interpreting and using assessment information to make decisions related to teaching and learning process. The findings of a study by the Malaysian Examinations Board (2014) stated that the diversity of teachers' level of understanding of the concept of school-based assessment is due to the lack of information sources.

The second issue is related to workload. Based on the report of the Malaysian Examinations Board (2013), the implementation of school-based assessment has increased the workload of teachers. Furthermore, referring to the report of the Malaysian Examinations Board (2014), the cause of the increased workload of teachers is due to the management of many files. The report also reported that there were suggestions from teachers to simplify the management of evidence for assessment.

The third issue is related to the level of teacher competence. According to the Special Education Division (2015), among the procedures for opening a ISEP is that teachers must be qualified in special education. However, referring to the Ministry of Education Malaysia (2012), this program are lack of qualified teachers. The same situation applies to PE subjects where they are taught by teachers who are not PE qualified trachers. In Perak, there are 233 teachers teaching PE, but only 10 teachers have a degree in PE. (Special Education Unit, 2018). The lack of qualified teachers can affect the teaching and learning process and assessment that been carried out. Although the teacher is trained in the field of special education, but the mastery of pedagogy in the teaching of PE also plays an important role that needs to be given attention. This statement is in line with Julismah and Syed Kamaruzaman (2012) who stated that PE in secondary schools should be taught by teachers who are qualified in PE.

The fourth issue is related to the difficulty of constructing assessment instruments. Based on the Ministry of Education Malaysia (2012b), teachers face difficulties in developing assessment instruments. In addition, referring to the report of the Malaysian Examinations Board (2014), teachers face difficulties in formulating assessment instruments because they are still unclear to implement assessment based on performance standards. Based on the report, respondents also suggested that the performance standard document be simplified and user -friendly. If this problem is not addressed, it is likely that teachers will make inaccurate assessments of the achievement of students' performance level.

The fifth issue is related to the lack of reference sources. Based on the report of the Malaysian Examinations Board (2014), reference sources related to classroom assessment are still insufficient. According to Liza (2017), although provided with reference sources such as textbooks, the assessment instruments are not holistic, incomplete and not comprehensive. Lack of reference sources can affect the effectiveness of assessment.

Based on the above problems, researchers have taken the initiative to build a AISNS. The complete assessment instrument can be used to measure the achievement of performance level accurately. Appropriate assessment practices can help teachers make improvements for the purpose of improving the quality of teaching and learning (Fakhri & Mohd Isha, 2016).

Assessment Instrument for Special Needs Students

Figure 1 shows the theoretical framework in developing the learning assessment instruments for invasion games in PE. Assessment Instrument for Special Needs Students is developed to test three main domains which are psychomotor, cognitive and affective. The researcher used three theories that act as strong foundation in developing this instrument. Those theories are Constructivism Theory, Revise Bloom's Taxonomy and Teaching Games for Understanding (TGfU). In order to produce instruments that are parallel to the requirements set by the MOE, the researchers refer to the Circular Letter by MOE and Malaysian Examination Board, PE Curriculum and Assessment Standard Documents (Special Education) and PE Text Book (Special Education).

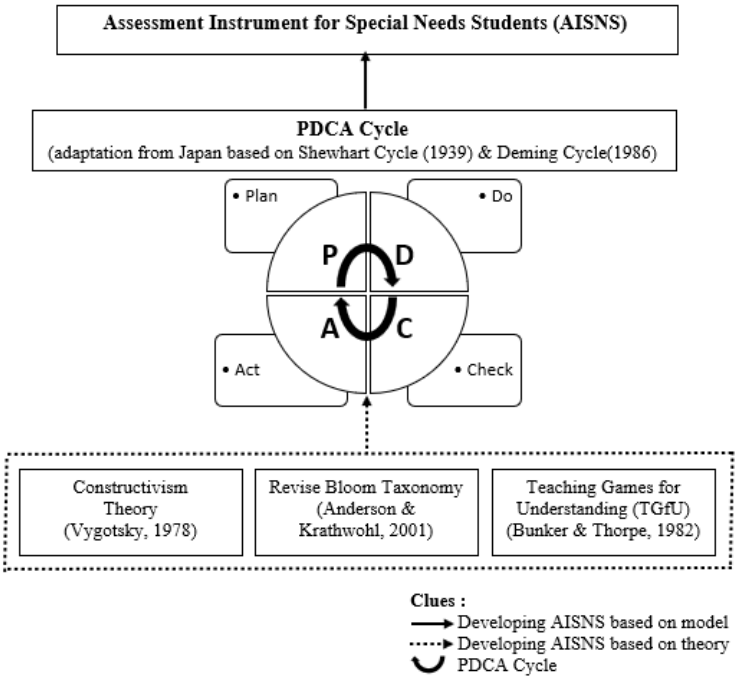

Figure 1: *Theoretical Framework*

The design of AISNS is based on the PDCA Cycle model. The PDCA Cycle Model is derived from the Shewhart Cycle in 1939. At that time, the cycle consisted of only three stages, namely specification, production and inspection. Dr. W. Edwards Deming who is a student of Dr. Walter Shewhart added another process to the cycle. In 1950, while speaking at the Japanese Union of Scientists and Engineers (JUSE) seminar, he added a fourth step for the Shewhart Cycle known as redesign through marketing research. Historians argue that the term Deming Cycle existed during the seminar (Abilla, 2014).

According to Misaki Imai, a Japanese executive took the idea of the Deming Cycle during the seminar and named it the PDCA Cycle (plan, do, check, act) in 1960. In 1986, Dr. W. Edwards Deming reintroduces the Shewhart Cycle. He said PDSA (plan, do, study, act) is more accurate

than PDCA because the term 'check' means 'hold back'. The term PDSA Cycle was first used in 1993 (Norman, 2016) (Moen & Norman, 2009).

In this study, the researchers used the PDCA Cycle as a basic and a guide in the process of designing and developing AISNS. This cycle is chosen because it is also used by the Department of Standards Malaysia. The PDCA cycle enables an organization to ensure that its processes are adequately sourced, managed and opportunities for improvement are identified and acted (Department of Standards Malaysia, 2017).

In order to develop AISNS, it involves two cycles called Cycle One and Cycle Two. Figure 2 illustrates the AISNS development process.

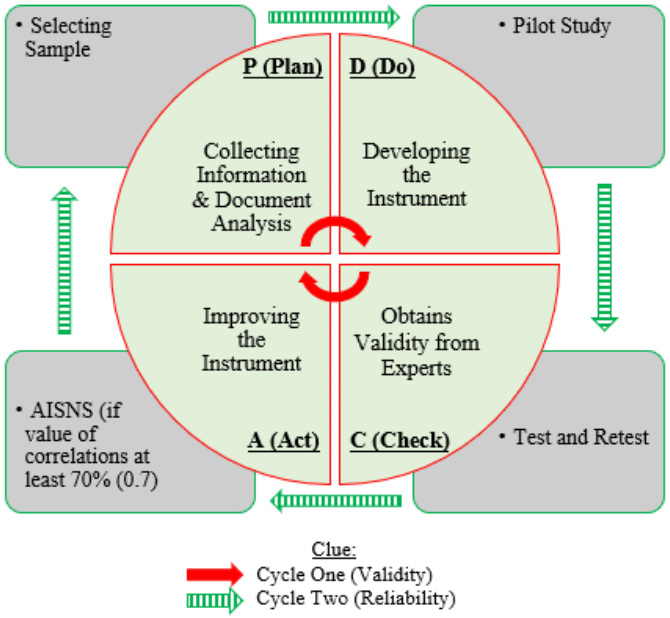

Figure 2: *Developing AISNS based on PDCA Cycle*

Methodology

Based on Figure 2, Cycle One is a cycle related to the AISNS development process and obtains validity from experts. The descriptions for each stage in this cycle are as follows:

i. Plan

Document analysis is performed to obtain prior information. The documents that have been referred are the Circular Letter by MOE and Examination Board, Classroom Assessment Implementation Guide 2018, PE (Special Education) Text Book and Standard Document of Curriculum and Assessment on PE (Special Education). Researchers have also conducted personnel communications among teachers and officials in the Perak Education Department's Special Education Unit to obtain information on PE implementation and assessment processes.

Field studies were also conducted to obtain information about the implementation of teaching and learning PE among SNS. The method of data collection is through observation and interviews.

ii. Do
After reviewing and analyze the relevant documents and theories, researchers developed the learning assessment instrument. The instrument is based on the level of performance achievement in Performance Standards. Assessment Instrument for Special Needs Students consist general teachers guide, daily lesson plans, test specifications tables, reinforcement questions and checklists.

iii. Check
Researchers obtain the recognition from a panel of experts on the quality of the instrument in terms of content suitability, method of assessment, technical and language of the instrument. These experts are author of PE (Special Education) textbooks Form 2, lecturers and teachers who expert in PE and ISEP.

iv. Act
The recommendations and reviews from the experts were analyzed and instrument was refined based on that information. This process will revert to the Plan, Do and Check stage. The instrument presented to the expert panel for the second time. Data are analyzed to determine validity of the AISNS. After obtaining the suitable validity value, the researcher will move to Cycle Two.

Cycle Two is a cycle related to the process of obtaining the reliability of the AISNS. The instrument has been implemented during pilot studies. The descriptions for each stage in Cycle Two are as follows:

i. Plan
Researchers have selected a secondary school in the North Kinta district of Perak that offers ISEP to conduct pilot studies. Two teachers and students (intact sampling) have involved in this studies.

ii. Do
The AISNS is used by the teacher during teaching and learning sessions. This instrument consist daily lesson plans and the assessment takes place throughout the learning and learning sessions.

iii. Check
The reliability between two teachers was analyze to obtain the objectivity of the instrument. According to Sidek & Jamaludin (2005), test and retest methods can be implemented to obtain the reliability coefficient values to see the objectivity of an instrument. Thus, researchers administered similar tests on the same group of students at different times to obtain reliability coefficients between the two testers (Ahmad, 2014).

iv. Act
The Pearson product moment correlation method was used to estimate the reliability of this assessment instrument.

Analyzes and Results

Research Objective I

Descriptive analysis was used to provide an initial overview of student achievement scores for the psychomotor, cognitive and affective domains. The breakdown according to the learning domain is made based on the performance standards statement that has been dismantled and translated into the performance level checklist form. The mean value describes the tendency of each variable on average.

Table 1
Determination of Achievement Level based on Mean Score

Domain	Mean Score		Interpretation
	Handball	Touch Rugby	
Psychomotor	12.01 - 15.00	10.41 - 13.00	Very high
	9.01 - 12.00	7.81 - 10.40	High
	6.01 - 9.00	5.21 - 7.80	Moderate
	3.01 - 6.00	2.61 - 5.20	Low
	0.00 - 3.00	0.00 - 2.60	Very low
Cognitive	7.21 - 9.00	4.81 - 6.00	Very high
	5.41 - 7.20	3.61 - 4.80	High
	3.61 - 5.40	2.41 - 3.60	Moderate
	1.81 - 3.60	1.21 - 2.40	Low
	0.00 - 1.80	0.00 - 1.20	Very low
Affective	4.01 - 5.00	4.01 - 5.00	Very high
	3.01 - 4.00	3.01 - 4.00	High
	2.01 - 3.00	2.01 - 3.00	Moderate
	1.01 - 2.00	1.01 - 2.00	Low
	0.00 - 1.00	0.00 - 1.00	Very low

Source: Adapted from Mohd Sahandri *et al.* (2013).

Table 1 shows the determination of the level of achievement of the psychomotor, cognitive and affective domains based on the mean scores for handball and touch rugby. According to Mohamad Najib (1999) mean score analysis can be used to determine each level of tendency of respondents in the evaluation of each research question.

Table 2
Achievement Level of Special Needs Students for Psychomotor, Cognitive and Affective domains by School Category

Games	Type of School	Domain	Percentage (%)	Mean	SD
Handball	Urban (*N* = 8)	Psychomotor	61.73	9.26	4.494
		Cognitive	46.44	4.18	2.455
		Afective	69.20	3.46	1.555
	Rural (*N* = 3)	Psychomotor	61.33	9.20	2.210
		Cognitive	38.52	3.47	2.264
		Affective	76.00	3.80	.941
Touch Rugby	Urban (*N* = 8)	Psychomotor	53.08	6.90	3.908
		Cognitive	30.67	1.84	1.037
		Afective	40.00	2.00	1.178
	Rural (*N* = 3)	Psychomotor	47.18	6.13	2.875
		Cognitive	27.78	1.67	.617
		Affective	30.67	1.53	.640

Table 2 shows the level of students achievement in psychomotor, cognitive and affective domains according to school category and type of games. For urban schools, the percentage of psychomotor domain achievement for handball was 61.73% (M=9.26, SD=4.494), cognitive domain 46.44% (M=4.18, SD=2.455) and affective domain 69.20% (M=3.46, SD=1.555). The mean score for the psychomotor domain (M=9.26) and affective domain (M=3.46) were at a high level while the cognitive domain (M=4.18) was at a moderate level.

The percentage of handball achievement for students in rural schools in psychomotor domain was 61.33% (M=9.20, SD=2.210), cognitive domain 38.52% (M=3.47, SD=2.264) and affective domain 76.00% (M=3.80 , SD=.941). The mean score for the psychomotor domain (M=9.20) and affective domain (M=3.80) were at a high level while for the cognitive domain (M=3.47) was at a low level.

Touch rugby for urban schools showed the achievement of psychomotor domain of 53.08% (M=6.90, SD=3.908), cognitive domain of 30.67% (M=1.84, SD=1.037) while affective domain of 40.00% (M=2.00 , SD=1.178). The mean score for the psychomotor domain (M=6.90) were at a moderate level while the cognitive domain (M=1.84) and affective domain (M=2.00) were at a low level.

Rural school achievement for touch rugby in the psychomotor domain was 47.18% (M=6.13, SD=2.875), the cognitive domain was 27.78% (M=1.67, SD=.617) and the affective domain was 30.67% (M=1.53, SD=.640). The mean score for the psychomotor domain (M=6.13) were at a

moderate level while the cognitive domain (M=1.67) and affective domain (M=1.53) were at a low level.

Research Objective II

Table 3
The Achievement of Performance Level for Special Needs Students by School Category

Type of School	N	Mean	SD	t	df	Sig. (2-tailed)	95% Confidence Interval	
							Lower	Upper
Handball								
Urban	50	2.52	1.34	1.703	33.47	.098	-.10097	1.14097
Rural	15	2.00	.93					
Touch Rugby								
Urban	50	2.28	1.23	.947	30.31	.351	-.32344	.88344
Rural	15	2.00	.93					

*significant at the .05 level

Table 3 shows a comparison of the mean scores of achievement of students performance level in urban and rural schools. Analysis showed no significant difference, t(33.47)=1.703, p=.098 in handball between urban schools (M=2.52, SP=1.34) and rural schools (M=2.00, SD=.93). Although the mean of students performance level in urban schools is higher than in rural schools, the existing data are not sufficient to show that these differences are significant. The 95% confidence interval for the mean difference is between -.10097 to 1.14097. The achievement of performance level for touch rugby between students in urban schools (M=2.28, SD=1.23) and rural schools (M=2.00, SD=.93) also showed no significant difference, t(30.31)=.947, p=.351. The 95% confidence interval for the mean difference is between -.32344 to .88344.

Table 4
The Achievement of Performance Level for Special Needs Students by Gender

Gender	N	Mean	SD	t	df	Sig. (2-tailed)	95% Confidence Interval	
							Lower	Upper
Handball								
Male	51	2.49	1.30	1.093	63	.279	-.34720	1.18474
Female	14	2.07	1.14					
Touch Rugby								
Male	51	2.25	1.16	.519	63	.606	-.52350	.89045
Female	14	2.07	1.21					

*significant at the .05 level

Table 4 shows the analysis of the Independent Sample t-test which compares the mean score of performance level achievement between male and female students. For handball, the result shows t(63)=1.093, p=.279. This value indicates that there is no significant difference in the achievement of the handball performance level between male (M=2.49, SD=1.30) and

female (M=2.07, SD=1.14). The 95% confidence interval for the mean difference is between -.34720 to 1.18474. The test results for touch rugby are t(63)=.519, p=.606. There is no significant difference in the achievement of touch rugby performance level between male (M=2.24, SD=1.16) and female (M=2.07, SD=1.21). The 95% confidence interval for the mean difference is between -.52350 to .89045.

Research Objective III

Table 5

Descriptives

Types of Disabilities	N	Mean	SD	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Handball								
Autism	5	1.20	.45	.20000	.6447	1.7553	1.00	2.00
Intellectual disabilities	35	2.66	1.30	.22055	2.2089	3.1054	1.00	6.00
Slow learner	19	2.32	1.34	.30639	1.6721	2.9595	1.00	5.00
Dyslexia	3	2.33	.58	.33333	.8991	3.7676	2.00	3.00
Total	**62**	**2.42**	**1.29**	**.16350**	**2.0924**	**2.7463**	**1.00**	**6.00**
Touch Rugby								
Autism	5	1.20	.45	.20000	.6447	1.7553	1.00	2.00
Intellectual disabilities	35	2.34	1.14	.19204	1.9526	2.7331	1.00	5.00
Slow learner	19	2.16	1.30	.29876	1.5302	2.7856	1.00	4.00
Dyslexia	3	2.33	.58	.33333	.8991	3.7676	2.00	3.00
Total	**62**	**2.19**	**1.16**	**.14696**	**1.8997**	**2.4874**	**1.00**	**5.00**

Table 5 shows the descriptive statistics of one -way ANOVA. Based on the table, students with intellectual disabilities recorded the highest mean value of performance level for handball (M = 2.66, SP = 1.30) and touch rugby (M = 2.34, SP = 1.14). The achievement of the highest level of performance level for students with intellectual disabilities in handball is performance level 6 while for the game of touch rugby is performance level 5.

Meanwhile, autism students recorded the lowest mean value of performance level (M = 1.20, SP = .45) for both games. The highest achievement of autism students in handball and touch rugby are performance level 2.

Table 6
Test of Homogeneity of Variances

Performance Level	Levene Statistic	df1	df2	Sig.
Handball	3.934	3	58	.013
Touch Rugby	6.199	3	58	.001

Table 7
ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
		Handball			
Between Groups	9.639	3	3.213	2.038	.119
Within Groups	91.458	58	1.577		
Total	101.097	61			
		Touch Rugby			
Between Groups	5.799	3	1.933	1.477	.230
Within Groups	75.879	58	1.308		
Total	81.677	61			

*significant at the .05 level

Based on Table 6, the significant values for the handball performance level are .013 and touch rugby .001. The significant value has violated the assumption of homogeneity of variances (significant value is less than .05). Thus, the F value in Table 7 has been ignored (Bhasah Abu Bakar, 2007).

Table 8
Robust Tests of Equality of Means

	Statistic[a]	df1	df2	Sig.
Handball	7.888	3	9.629	.006
Touch Rugby	5.820	3	9.234	.016

a Asymptotically F distributed

Table 9
Post Hoc Tests

(A) Types of Disabilities	(B) Types of Disabilities	Mean Difference (A-B)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
		Handball				
Autism	Intellectual disabilities	-1.45714*	.29773	.001	-2.3049	-.6094
	Slow learner	-1.11579*	.36589	.030	-2.1392	-.0923
	Dyslexia	-1.13333	.38873	.151	-2.8413	.5746
Intellectual disabilities	Autism	1.45714*	.29773	.001	.6094	2.3049
	Slow learner	.34135	.37752	.803	-.6750	1.3577
	Dyslexia	.32381	.39969	.847	-1.2859	1.9335
Slow learner	Autism	1.11579*	.36589	.030	.0923	2.1392
	Intellectual disabilities	-.34135	.37752	.803	-1.3577	.6750
	Dyslexia	-.01754	.45275	1.000	-1.5610	1.5259
Dyslexia	Autisme	1.13333	.38873	.151	-.5746	2.8413
	Intellectual disabilities	-.32381	.39969	.847	-1.9335	1.2859
	Slow learner	.01754	.45275	1.000	-1.5259	1.5610
		Touch Rugby				
Autism	Intellectual disabilities	-1.14286*	.27727	.005	-1.9531	-.3326
	Slow learner	-.95789	.35953	.066	-1.9649	.0492
	Dyslexia	-1.13333	.38873	.151	-2.8413	.5746
Intellectual disabilities	Autism	1.14286*	.27727	.005	.3326	1.9531
	Slow learner	.18496	.35516	.953	-.7758	1.1457
	Disleksia	.00952	.38469	1.000	-1.6664	1.6854
Slow learner	Autism	.95789	.35953	.066	-.0492	1.9649
	Intellectual disabilities	-.18496	.35516	.953	-1.1457	.7758
	Dyslexia	-.17544	.44763	.978	-1.7195	1.3686
Dyslexia	Autism	1.13333	.38873	.151	-.5746	2.8413
	Intellectual disabilities	-.00952	.38469	1.000	-1.6854	1.6664
	Slow learner	.17544	.44763	.978	-1.3686	1.7195

*The mean difference is significant at the .05 level.

As an alternative to answering the research questions, the researchers conducted an ANOVA using the Welch test. According to Grande (2016) and Frost (2020), Welch tests are conducted if the sample size is not the same and violates the assumption of homogeneity of variances. Based on Table 8 the significant values for handball p<.05, p=.006 and touch rugby are p<.05, p=.016. This means that there are significant differences in the achievement of the performance level of handball and touch rugby according to the type of disabilities.

The continuity of significant values obtained is referred to Table 7 and Table 9. Based on the Post-Hoc comparison using the Games-Howell test, the results of the analysis showed that the mean score of handball performance level for autism (M=1.20, SP=.45) differed significantly with intellectual disabilities (M=2.66, SP=1.30) and slow learner (M=2.32, SP=1.34). Post-Hoc comparisons for touch rugby showed that the mean score of performance level for autism (M=1.20, SP=.45) differed significantly from intellectual disabilities (M=2.34, SP=1.14).

Research Objective IV

Table 10
Descriptive Statistics Two -Way ANOVA

Types of Disabilities	Gender	Mean	SD	N
	Performance Level of Handball			
Intellectual disabilities	Male	2.82	1.28	28
	Female	2.00	1.29	7
	Total	**2.66**	**1.30**	**35**
Slow learner	Male	2.36	1.39	14
	Female	2.20	1.30	5
	Total	**2.32**	**1.33**	**19**
Dyslexia	Male	2.50	.71	2
	Female	2.00	-	1
	Total	**2.33**	**.58**	**3**
Total	Male	**2.66**	**1.29**	**44**
	Female	**2.08**	**1.19**	**13**
	Total	**2.53**	**1.28**	**57**
	Performance Level of Touch Rugby			
Intellectual disabilities	Male	2.43	1.10	28
	Female	2.00	1.29	7
	Total	**2.34**	**1.14**	**35**
Slow learner	Male	2.21	1.31	14
	Female	2.00	1.41	5
	Total	**2.16**	1.30	**19**
Dyslexia	Male	2.50	.71	2
	Female	2.00	-	1
	Total	**2.33**	**.58**	**3**

Total	Male	2.36	1.14	44
	Female	2.00	1.22	13
	Total	**2.28**	**1.16**	**57**

Based on Table 9, the analysis showed that male students with intellectual disabilities (N = 28) obtained the highest achievement of the performance level in handball (M = 2.82, SP = 1.28) and touch rugby (M = 2.43, SP = 1.10). Slow learner female students (N = 5) obtained the highest achievement of the performance level in handball (M = 2.20, SP = 1.30). Meanwhile, female students were intellectually disabled (M = 2.00, SP = 1.29, N = 7), slow learner (M = 2.00, SP = 1.41, N = 5) and dyslexia (M = 2.00, SP = -, N = 1) obtained the same achievement of the performance level in touch rugby.

Table 11
Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power [a]
				Handball				
Corrected Model	5.589b	5	1.118	.658	.657	.657	3.291	.220
Intercept	98.777	1	98.777	58.157	.000	.000	58.157	1.000
Gender	.184	2	.092	.054	.947	.947	.109	.058
Type	1.121	1	1.121	.660	.420	.420	.660	.125
Gender * Type	.983	2	.491	.289	.750	.750	.579	.093
Error	86.621	51	1.698					
Total	456.000	57						
Corrected Total	92.211	56						
				Touch Rugby				
Corrected Model	1.794b	5	.359	.248	.939	.024	1.242	.105
Intercept	88.582	1	88.582	61.286	.000	.546	61.286	1.000
Gender	.117	2	.059	.041	.960	.002	.081	.056
Type	.670	1	.670	.463	.499	.009	.463	.102

Gender * Type	.117	2	.059	.041	.960	.002	.081	.056
Error	73.714	51	1.445					
Total	372.000	57						
Corrected Total	75.509	56						

Computed using alpha = .05
R Squared (handball) = .061 (adjusted R Squared = -.031)
(touch rugby) = .024 (adjusted R squared = -.072)

Table 11 shows the effect tests between subjects. For handball, there was no significant main effect for the type of disability at the level of p> .05, F (2, 51) = .054, p = .947 and gender at the level of p> .05, F (1, 51)) = .660, p = .420. The interaction effect between type of disability and gender was insignificant on achievement of the performance level (type*gender; p = .750). This analysis showed that there was no significant difference in the effect of disability type for male and female students.

For touch rugby, there was no significant main effect for the type of disability at the level of p> .05, F (2, 51) = .041, p = .960 and gender at the level of p> .05, F (1, 51) = .463, p = .499. The interaction effect between type of disability and gender was insignificant on achievement of the performance level (type*gender; p = .960). This analysis showed that there was no significant difference in the effect of disability type for male and female students.

Research Objective V

Table 12
Correlations

Types of Disabilities			**Performance Level**	
			Handball	**Touch Rugby**
Autism	Handball performance level	*Pearson Correlation*	1	1.000**
		Sig. (2-tailed)		.000
		N	5	5
	Touch Rugby performance level	*Pearson Correlation*	1.000**	1
		Sig. (2-tailed)	.000	
		N	5	5
Intellectual disabilities		*Pearson Correlation*	1	.855**

	Handball performance level	*Sig.* (2-tailed)		.000
		N	35	35
	Touch Rugby performance level	*Pearson Correlation*	.855**	1
		Sig. (2-tailed)	.000	
		N	35	35
Slow learner	Handball performance level	*Pearson Correlation*	1	.960**
		Sig. (2-tailed)		.000
		N	19	19
	Touch Rugby performance level	*Pearson Correlation*	.960**	1
		Sig. (2-tailed)	.000	
		N	19	19
Dyslexia	Handball performance level	*Pearson Correlation*	1	1.000**
		Sig. (2-tailed)		.000
		N	3	3
	Touch Rugby performance level	*Pearson Correlation*	1.000**	1
		Sig. (2-tailed)	.000	
		N	3	3

**Correlation is significant at the 0.01 level (2-tailed)

Table 13
Interpretation of Correlation Coefficient (Miller, 2006)

Coefficient Interval	Correlation
0.00 - 0.20	Low or no correlation
0.20 - 0.40	Weak
0.40 - 0.60	Moderate
0.60 - 0.80	Strong
0.80 - 1.00	Very strong

The analysis results showed that there was a very strong and significant relationship for the achievement of handball and touch rugby performance level for autism students (r=1.00,

p=.000, p<0.01) and intellectual disabilities students (r=.86, p=.000, p<0.01). Slow learner students (r=.96, p=.000, p <0.01) and dyslexia students (r=1.00, p=.000, p <0.01) also showed that there was a very strong and significant relationship for the achievement in handball performance level and touch rugby. The findings show that there is a significant relationship between the handball and touch rugby performance level with all types of student disabilities.

Discussion & Suggestion

(a) Research Objective I

Student achievement for each learning domain is assessed based on a statement of performance standards. The achievements of each of these domains are also closely related to each other. For example, for touch rugby skills, students with low achievement in the psychomotor domain resulted in their achievement in the affective domain also being low. This is because student achievement in the affective domain can only be assessed if their achievement in the psychomotor domain is at performance levels 5 and 6. Student achievement in the affective domain will be affected if students do not master psychomotor skills well. This means that students need to master psychomotor skills until they reach performance level 5, then achievement in the affective domain can be assessed. The relationship between these learning domains is in line with Sonmez (2017) who stated, if the level of student achievement for the cognitive and psychomotor domains increases, a significant increase is also shown for the affective domains.

(b) Research Objective II

This finding is in line with the results of a study by Mohd Izwan (2017) in the game of badminton involving Form Two students. The findings of the analysis using the Learning Assessment Instrument Model based on TGfU showed that there was no significant difference in the mean scores of psychomotor, cognitive and affective domains on the achievement of students' learning level by gender in day school. A study by Abdul Razak (2017) also showed similar results. Based on the Reasoning Skills Assessment Test for net and wall category games, the analysis showed that there was no significant difference in the achievement of male and female students in urban and rural schools.

The AISNS covers assessments for all domains of learning. However, the mastery in the psychomotor domain is preferred because it is assessed from performance level 1 to 6. Due to this factor, the study findings show that the mean value of mastery level achievement of male students is higher than female. This is because male students are more likely to master psychomotor skills than female students. The statement is also supported by Slingerland et al. (2014), who stated that male students were more active and showed better levels of psychomotor mastery than female students. Nevertheless, Smith (2015) states, when viewed from an academic aspect, the achievement of female students is higher than that of males. This is because, the level of academic achievement of male students can be influenced by behavioral factors.

Although it is difficult to conduct studies to look at differences in achievement based on gender, researchers believe there are benefits to be gained if it can be done. Through the findings of this study, information related to the achievement of male and female students can be used as a guide for teachers to plan a lesson more effectively. For example,

information related to the achievement of male and female students can be referred to as a guide to form groups in small play activities. The strength of each group needs to be balanced while performing small game activities so that the game can be implemented more smoothly.

(c) Research Objective III

The findings of the study also showed that the mean value of performance level for autistic students was the lowest for the invasion category game. Although according to the Ministry of Education Malaysia (2020a), the percentage of autistic students is only 10% from the student population in secondary schools, but continuous efforts among educators and researchers can help improve their level of achievement.

One of the efforts that can be done to increase the mastery level of autistic students is to encourage them to be more social with their peers. This recommendation is consistent with the results of the study of Bertills et al. (2019), who stated that autistic students prefer to be alone and are less likely to socialize with friends. Teachers should encourage students to engage in group activities. The more active involvement of autistic students in group activities can indirectly improve their social skills.

Suggestions by Movahedazarhouligh & Sara (2018) were also applied where the researchers asked teachers to do demonstrations while teaching, use video aids and provide reinforcement on student behavior. Applying all the proposed aspects is able to improve the achievement of students performance level. Although there are differences in the achievement of students performance levels according to the type of disability, accurate assessment results can be used to identify students weaknesses more specifically.

(d) Research Objective IV

The accuracy of the determination of performance level is important for teachers to identify the level of development of student learning. Complete and accurate information can be used as a guide for teachers before preparing an Individual Education Plan. The requirement to prepare an Individual Education Plan is based on the Ministry of Education Malaysia (2004) and it should be implemented to all students based on their needs (Special Education Division, 2015). Individual Education Plans need to be prepared to identify the level of achievement and development of students which is usually done through diagnostic tests orally, in writing and observation. Accurate information from AISNS can be used by teachers to prepare Individual Education Plans.

Imms et al. (2017) stressed that teachers need to monitor student activities because they tend to be less social and like to be alone. Although the number of students is not many, researchers encourage teachers to use the services of Student Management Assistants. The assistant can play the role of a teacher's assistant. If teachers do not face problems related to student management, lesson sessions can run more smoothly and make it easier for teachers to assess student achievement.

(e) Research Objective V

In addition to the significant relationship between the achievement of students performace level and the type of disability, the close relationship between teachers and students can also affect student achievement. Typically, students with special needs are closer to teachers than

peers. The student-centered approach applied in the construction of lesson plan is able to enhance the relationship between teachers and students. The support services from the Student Management Assistant also have a positive impact and can indirectly motivate students to learn. Such an approach was implemented based on the recommendations of Giangreco et al. (2010 as noted in Bertills et al., 2019) who stated, the implementation of PdP will be easier if there is help from a semi-professional group.

Munafo (2016) states that students need to be prepared to learn so that they are more focused to face situations where they need to make decisions. Next, Atieno (2017) stressed, students need to master decision making skills as it is able to increase confidence levels and performance. Therefore, researchers have applied these skills in small game activities. Referring to the statement of performance standards, decision-making skills were assessed at performance level 5. The findings of the study showed that a total of two students have successfully mastered these skills. Although the number is small, but it is a positive indicator that students with special needs also have the potential to succeed like normal students.

Conclusion

The AISNS based on the invasion category game in Form Two PE is valid and reliable. The effectiveness of AISNS was tested during a field study in schools. Teachers also agreed that AISNS is suitable to be used to assess performance level more effectively.

Based on the findings of the study, the researcher would like to suggest improvements that can be implemented on PE Curriculum and Assessment Standard Documents for SNS. This suggestions can be considered if the Curriculum Development Division wants to refine the curriculum in the future. Researchers recommend that affective domain related statements be added for each performance level. Referring to the performance standard statement for handball and touch rugby, the affective domain is only assessed at performance level 5 and 6. The achievement for the affective domain cannot be assessed if the student does not achieve that level.

In addition, researchers would like to suggest that the number game and learning standards be reduced. Special needs students will take longer time to master that particular skill compared to mainstream students. If the number game and learning standards reduced, students have a more appropriate period of time to master the skills better. Quality teaching is better than teaching that only chases quantity because students can utilize the knowledge in daily life.

Researchers hoped that AISNS can be used as a guide to assess the level of performance level . Continuous efforts to improve the performance of students are expected to generate their excellence in line with the goals of national education.

Contribution of Study

The content of AISNS is complete which includes aspects of teaching planning and implementation, preparation of reinforcement questions and assessment guidelines. This instrument can be referred to by most PE teachers. In addition, it can also help teachers to understand and appreciate the implementation process of teaching and assessment in PE.

The requirement of classroom assessment is to provide complete assessment records for students. The results of this study can be used as a guide for teachers to plan and build assessment instruments. The foundation for the construction of assessment instrument that is geared towards all standards in the Curriculum and Assessment Standard Documents can further enhance the level of assessment effectiveness. For teachers who are less skilled at creating instruments, AISNS can be modified based on the topics. In addition, PE teachers in the mainstream school can also refer to AISNS because all standards in PE Curriculum and Assessment Standard Documents for SNS and Curriculum and Assessment Standard Documents for mainstream students are same.

The AISNS contains a complete record of the student's learning achievement. Based on these records, teachers can provide a complete report on student performance. This report can be used if teachers want to report the learning status and achievement of students to their parents. Futher actions and improvements can also be implemented to prevent students from dropping out of learning.

The AISNS is expected to benefit teachers, school administrators, management officers in the District and State Education Department, Curriculum Development Division and the Malaysian Examinations Board. Hopefully AISNS can contribute towards the implementation of school assessment holistically so that MOE desire to transform the education system can be realized.

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