Authentic Assessment Process of Autistic Students with Asperger Disorder at STOU

Thanyasinee Laosum
Sukhothai Thammathirat Open University, Thailand
thanyasinee.lao@stou.ac.th

Sukolrat Ingchatcharoen
Sukhothai Thammathirat Open University, Thailand
sukolrat.Ing@stou.ac.th

ARTICLE INFO: Received: **25 June 2021**; Revised: **1 Dec 2021**;
Accepted: **24 Dec 2021**; Available Online: **31 Dec 2021**

Abstract

The purpose of this research was to study authentic assessment of students with Asperger Disorder at Sukhothai Thammathirat Open University, which covers: 1) the present practice of assessment for students with Asperger Disorder, 2) development and evaluation of the designed process, and 3) study of the outcome of the implementation. The research informants comprised four groups. Group 1, with 13 informants, was involved in the current practice of assessment, while Group 2, with six informants, in the study on authentic assessment process, Group 3, with 11 informants, in the study on the evaluation of the authentic assessment process, and Group 4, with eight informants, in the study on results of the implementation. These informative data, comprising interviewed data and samples of work, were analysed through content analysis. The results were: 1) the university had no specific assessment process for autistic students, 2) the developed process was appropriate and feasible, and 3) the developed process helped students to obtain higher achievement. The process comprised three elements. Element 1 was the design of assessment components, which comprises planning, assessment tools, marking procedure, marking criteria, and roles of involving parties. Element 2 involved assessment of Asperger Disorder among students, which comprises planning and preparation for lecturing and learning, implementation of the plan, assessment of learning, and summary of the assessment. Element 3 included factors facilitating success, which comprises supporting systems and mechanisms to promote success.

Keywords: *Asperger Disorder, Assessment, Authentic Education, Autistic, Evaluation, Sukhothai Thammathirat Open University*

Introduction

The Constitution of the Kingdom of Thailand 2017, the National Education Act 1999, and the Education Management for the Disabled Act 2008 all emphasise the importance of educational rights and freedom of the disabled. The government is therefore supposed to provide educational access to those who are disadvantaged in either physical, spiritual, intellectual, emotional, social, communicative, or learning disabilities; including those who

are not self-dependent, and who do not have guardians. In addition, the Higher Education Commission Regulation Concerning the Promotion of Education Services for the Disabled 2009 (Office of the Higher Education Commission, 2010) stipulates that private or public higher education institutions must admit appropriate numbers of disabled students into their programmes. The public or private higher education institutions shall also provide appropriate and sufficient physical and learning facilities conducive to their learning, and with respect to each type of disability.

Autism is one of the seven types of disabilities as classified by the Ministry of Social Development and Human Security (MSDHS). Autistic individuals are entitled to educational rights (Ministry of Social Development and Human Security, 2012). According to the Ministry of Social Development and Human Security (2012), an autistic person refers to any person who is disadvantaged in the following three categories: social interaction, personal communication, and unnecessarily repeated behaviours (Hepburn et al., 2018). The autistic, however, can understand and conceptualise concrete matters. They can learn through visualisation and can respond more effectively to a clearly structural concept or idea (Office of the Higher Education Commission, 2012).

Sukhothai Thammathirat Open University (STOU) is the only Thai open university offering distance learning programmes and opportunities to all Thais with no limits in age, sex, religion, career, ability, or personal or social status. Autistic individuals are among those who have registered with STOU since 2002. Some autistic students have managed to score “Honours” marks in some subjects, while a few scored “Satisfactory” marks in most subjects. However, a number of autistic students failed in their programmes (Sukhothai Thammathirat Open University [STOU], 2013).

A number of autistic students were classified as having Asperger Disorder. They have poor social skills compared to other autistic variants. They repeat their behaviour and are less flexible in dealing with others, thus they tend to communicate less with their Asperger Disorder peers. Some sufferers of Asperger Disorder behave similarly to those of the general autistic, but are somewhat different in details. For example, sufferers of Asperger Disorder prefer to hide their eyes from others while communicating and tend to separate themselves from a group. They have difficulties in group collaboration, which thus impedes them from distance learning success. The university therefore seeks an effective means that can help autistic students better cope with their disabilities, particularly in terms of their assessment (STOU, 2013).

STOU is fully aware of educational opportunities of autistic students, and has thus invested efforts to fulfil their educational needs through distance learning. Since 2010, with the implementation of the Higher Education Commission Regulation Concerning the Promotion of Education Services for the Disabled 2009, the university has improved services for the autistic in several ways. A service centre was specially established for the disabled. With a few adjustments, however, the university is not quite satisfied with the services provided to individual autistic students, who are each different in autistic types and learning styles. It is possible that the learning design and assessment model applied are not quite suited to various autistic types present among the students. Specifically, the assessment type used by the university, which focuses mainly on summative tests, which may not reflect true learning of the individual autistic clientele.

Personal limitations and learning styles of students with Asperger Disorder were different from their normal counterparts. American Educational Research Association, American Psychological Association and National Council on Measurement in Education (1999) allow higher education institutions to adjust assessment practices according to needs of special students. The interest here lies in designing an assessment process for students with Asperger Disorder under the context and educational standards of STOU with the hope

that autistic graduates will have knowledge and skills that meet STOU curricular requirements.

Literature Review

The following literature: i) assessment of autistic students, ii) assessment of autistic students at STOU, iii) assessment accommodation, iv) authentic assessment, and v) autistic students with Asperger Disorder were reviewed in this study.

i. Assessment of autistic students. Durocher (2010) and Ontario Ministry of Education (2007) proposed that an autistic students' assessor needs to understand limitations of the assessed. Various flexible assessment techniques should be employed, and in accordance with the learning development level of individual students. These would help the assessor select the appropriate assessment tools and his/her ability to collect sufficient data regarding the real potential of the student. The assessor might also look for data related to learning interests, styles, needs, and progress so that the teacher could use these data to adjust his/her instruction accordingly.
ii. Assessment of autistic students at STOU. A few research studies related to learning and assessment of the disabled at STOU have been conducted. Phonapichat (2016) studied the different types of test management of disabled individuals who enrolled in STOU distance learning programmes. Na Nakorn et al. (2016) studied the appropriate number of test items to be used with distance learning autistic students. Findings of this latter study led to the adjustment of the number of test items, test format, alphabet size, item arrangement, and the testing physical environment. Currently, STOU autistic students are provided with the following: 1) each student is given three hours for a test. This is similar to normal students, except the autistic student gets an extra intermission during the test under the supervision of the test supervisor, 2) autistic students who cannot write their answers to open-ended questions are allowed to answer using an audiotape, 3) the number of test items could be deducted, but it must maintain the main concept of the subject that the autistic student is enrolled in, and 4) the test supervisor may provide some assistance to the autistic students according to their disorders. For instance, the supervisor may provide additional explanation, but not guide the answer, necessary for the autistic students to understand the question (STOU, 2013).
iii. Assessment accommodation. It is recommended that higher education institutions that enrol autistic students arranges accommodation necessary for the assessment of these students according to their needs and limitations. Hees et al. (2015) suggested the following academic assistance is provided to autistic students: adjusted testing time, preparation time for the test, special testing room, and allowing time to perform activities according to one's interest. The College Board (2005, cited in Palmer, 2005) found that autistic students with handwriting difficulty could receive assistance from a writing assistant who could write the answer as instructed. The accommodation provided could reflect true learning progress of autistic students. Further, the accommodation selected should be fair and meet the needs of individual autistic students.
iv. Authentic assessment. Authentic assessment provides alternatives to the assessment of the autistic students. Alternated assessment often used with autistic students include project works, portfolios, observations, interviews, and self-assessment. Instead of relying only on the test result, these alternatives could help provide additional data to assessor (Office of the Royal Society, 2012; Thumthong, 2013). In fact, these alternatives are useful for the assessment of all types of students. They allow the assessor to gather data related to social or interactive skills outside the classroom of the assessed. Elsworth (2017) found that these assessment alternatives helped the assessor assess honesty and endurance of the assessed. Stiggins (1987) proposed that the authentic assessment of autistic students should be integrative, i.e., the integration of both knowledge and skills. Herman, Aschbacher, and Winters as cited in Burke (1992,

as cited in Burke, 2009) suggested that the assessment of autistic students should incorporate various assessment tools instead of reliance only on the objective test. Wiggins (1993) further suggested that assessment should also include hands-on components, or the authentic assessment of student practice. Vidhayasirinun (2012) found that authentic assessment is an efficient assessment tool for the autistic and students with special needs. Boman et al. (2008) and Hepburn et al. (2015) and Kluth (2010) found that authentic assessment allows students to demonstrate their knowledge and skills in performing complex tasks, which truly reflects their skills in applying what they have learnt in real-life situations. The use of testing, together with interviews, observations, portfolios, exhibitions, and practical works would help validate true learning of autistic students. Altman et al. (2010, as cited in Thurlow & Quenemoen, 2016) similarly suggested through their research findings that a mixed assessment tool incorporating the assessment of portfolios and work experience is appropriate for students with special needs. Ontario Ministry of Education (2007) therefore concluded that assessment of autistic students should incorporate data through various tools and from various sources, and keeping in mind that the developmental progress of individual autistic students not be neglected.

v. Autistic students with Asperger Disorder. Like students with Autistic Disorder, students with Asperger Disorder show impaired social interaction and display a limited field of interests and activities prior to three years of age. This impairment causes difficulties in social and/or occupational functioning. The difference between students with Autistic Disorder and Asperger Disorder is that the latter show no significant delay in language acquisition, although a subtler aspect of social communication may be affected. There are no significant delays in cognitive development or the acquisition of age-appropriate learning skills or adaptive interactions. Restricted, repetitive patterns of interaction, interests, and activities are common. Students with Asperger Disorder may experience feelings of social isolation, which may contribute to depression or anxiety in adolescence (Ontario Ministry of Education, 2007).

Objectives and Scope of the Study

The objectives of this study were to: i) study the present practice of assessment of students with Asperger Disorder, ii) develop and evaluate the designed authentic assessment process, and iii) study the outcome of the implementation of the designed process.

The scope of this study was as follows:

i. This study intended to develop an authentic assessment process of undergraduate students with Asperger Disorder who enrolled in open education programmes through distance learning with emphasis on the utilisation of various instructional technology, such as printed materials, radio and TV programmes, remedial learning, and self-learning.
ii. The authentic assessment process developed was not intended as a way to decide on the “pass” or “fail” status of the students who participated in this experiment. Instead, the study intended to develop an authentic assessment process applicable to students with Asperger Disorder. In addition, recommendations of the study should lead to the development of a learning support system usable in general education subjects in the social sciences.
iii. In the experimentation of the authentic assessment process of students with Asperger Disorder, the process was employed on students who enrolled in the Thai Study course. The topics selected for the experiment were jointly decided by the researcher and course instructor. These included the topics on “Thai Language in Daily Life and Thai Society” and “Thai Literature”, which are closely connected. The topics cover both theoretical concepts and a practical guide.

iv. Autistic volunteers who participated in the assessment. These were individuals with Asperger Disorder who could live their life normally, except in dealing with others. Their interactions with other were quite often unpredictable.

Research Method

Research Informants

Informants of the study were purposefully sampled, and were divided into four groups:

i. Thirteen senior scholars, parents of autistic students, STOU staff, Chairpersons of the academic programmes, Director and staff of the Office of Registration, Records and Evaluation, and Director and staff of the Office of Educational Services, who were knowledgeable in the present status of the assessment of STOU autistic students. The 13 informants were comprehensively interviewed.
ii. Six senior scholars in teaching and learning, and the assessment process of autistic students. The six informants were comprehensively interviewed.
iii. Eleven connoisseurs were selected and participated in the connoisseurship seminar, and helped assess the appropriateness and feasibility of the drafted assessment process. These connoisseurs consisted of administrators/chairpersons of the educational programmes, chairpersons of the learning module developer, director and staff of the Office of Registration, Records and Evaluation, administrator/representative of the Office of Educational Services, senior scholars in the teaching and learning system, and senior scholars in assessment.
iv. The subject coordinators were two experienced Thai lecturers who had each lectured Thai language for more than five years. The lecturer's assistant also had experience in providing learning support to the students and had a positive attitude towards autistic students. At least five years of experience were also required for the lecturer's assistant. The parents and students participated in the experiment voluntarily. Both the parents and the students were briefed on the expectation of the research. At the beginning, three students with Asperger Disorder were approached. Only two parents and three students met the expectations and requirements of the study. A student dropped out from the study due to his inability to participate up to 80 percent in the designed activities as required by the study.

The three selected Asperger Disorder volunteers possessed the following native abilities:

Volunteer 1 was very good in playing the guitar and able to memorise and create his own codes for learning. However, he could not maintain learning concentration and lacked social skills. He frequently repeated his acts. Age, gender, and level of severity are 22 years, male, and moderate.

Volunteer 2 was good in communication and memorisation. His learning weaknesses were that he lacked experience in the subject he enrolled in, and that he preferred to distance himself from others. Age, gender, and level of severity are 25 years, male, and moderate.

Volunteer 3 was good in computing and technological skills, and possessed good memorisation. His learning weaknesses were that he possessed a short learning concentration, and that he often repeated his own acts. He often felt depressed and expected acceptance from the people around him. Age, gender, and level of severity are 24 years, male, and moderate.

Materials and Tools

The tools used in this study included: 1) four sets of structured interview questions comprising Set 1 for programme administrator, head of the subject lecturers, and a lecturer, Set 2 for director of the Office of Registration, Records and Evaluation and one office's representative, Set 3 for director of the Office of Educational Services and an office's representative, Set 4 for parents of the two autistic students who participated in the study; 2) a set of structured interview questions concerning the assessment process for autistic students, which included five sets of questions for senior scholars in teaching and learning, and the assessment of autistic students. The validity test of the questionnaire through the Index of Item Objective Congruence (IOC) of the five sets yielded a value between .67 – 1.00, which is higher than the .50 required by Rovinelli and Hambleton (1977); 3) experimental tools which included Thai Language lesson plans, learning and teaching media, mind-mapping of the Thai language content, Thai Language PowerPoint set, four-choice multiple choice pre-test and post-test questions both in online and offline formats, in which participating autistic students could choose any 10 questions from the list and according to their personal interest, and two supplementary sets of essay tests that require the students to write their own answers in two separate answer sheets (sets 1 and 2 are worth 35 and 40 marks respectively).

Data Analysis

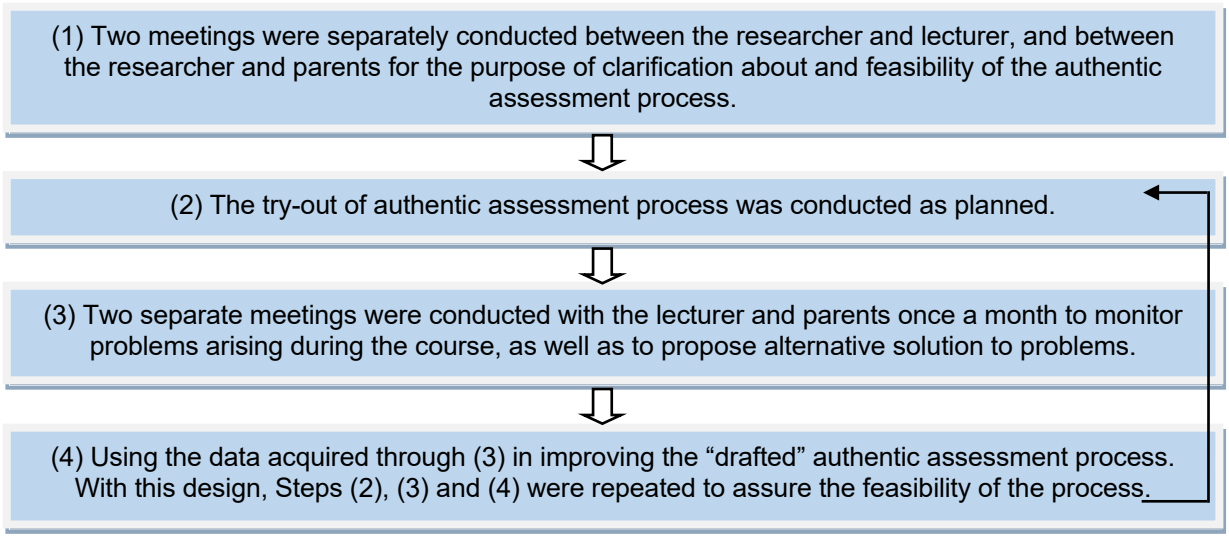
Content analysis was used to analyse documentary data, interviewed and connoisseurship seminar information, and evidential facts derived from the experiment.

4.4. Experimentation

The drafted authentic assessment process for autistic students was piloted with three students with Asperger Disorder who enrolled in the Thai Study course. The three volunteers who were enrolled in the undergraduate programme participated in the study. The experiment was divided into four steps as shown in Figure 1.

Figure 1

Experimental Process of Authentic Assessment for Students with Asperger Disorder



Findings and Discussion

The findings of the study were as follows:

i. It was found that the final exam assessment mainly used with autistic students at STOU was similar to the one used with regular students. The university had no specific assessment process for particular groups of students. However, in the past, the university had provided some assessment tools that helped autistic students perform their tests with greater ease. For example, the university had reduced the number of test items, enlarged the alphabet size, arranged the exam questions and their choices in the same column, organised individualised test sessions, and provided an exam intermission.

ii. The developed assessment process through this study, which was considered appropriate and feasible, consisted of three elements.

- Element 1: The authentic assessment design consisted of five sub-elements. Sub-element 1.1 is the planning for an authentic assessment, which included setting assessment objectives covering cognitive, affective, and psychomotor domains. The test assessed how well the students applied what they learnt in their daily life. How well can these students apply their knowledge and experience together with their interests in creating new learning situations that help them learn through hands-on experience? The students became more accountable and gained more knowledge, in comparison to if they went through a regular assessment process. In short, they authentically learned. Sub-element 1.2 is the development of an authentic assessment tool. The tools covered the assessment of cognitive, affective, and psychomotor domains. Sub-element 1.3 involves the guideline for student assessment. The guideline should help the assessor truly assess student learning. Sub-element 1.4 is the guideline for student marking. The guideline should correspond to student's learning activities and objectives. Sub-element 1.5 covers the roles of the people involved in assessment, who include lecturer, lecturer's assistant, parents, and students. The lecturer set learning objectives, prepared lesson plans for the autistic students, arranged learning facilities, prepared learning activities, set assessment criteria, performed authentic assessment, monitored student performance, and provided necessary aid while the autistic students worked on the test. The lecturer's assistant helped the lecturer in preparing the lesson plans and learning lessons, coordinated with the students and the lecturer, facilitated for and assisted students with learning difficulty, provided advice and remedial classes as well as monitor student learning, and provided feedback to the parents. Meanwhile, the parents helped the lecturer in preparing the students for the class, helped solve personal and learning problems, as well as monitor student learning. The students invested their time and effort in learning. They spent their time performing their learning assignments.
- Element 2: The authentic assessment. This element consisted of four sub-elements. Sub-element 2.1 is the planning and preparation for authentic assessment, which comprised the setting of scope, goals and objectives of the assessment, the preparation of student's learning plan, development of assessment tools, design of learning activities, setting of assessment criteria, and preparation of student's physical learning activities. Sub-element 2.2 is the implementation of the student's learning plan. The lecturer explained to the students what, when, and how to act on the learning activities. The students were advised to select the activities that fit their own aptitudes and interests. The lecturer and the lecturer's assistant helped the students to learn as well as monitored individual student learning. Sub-element 2.3 is the assessment of student's learning as planned. The lecturer assessed how well individual students performed. Feedback was also given so that the autistic students

could improve their performance within the agreed time. The lecturer reassessed the new work or performance of the students. Sub-element 2.4 is the conclusion of the authentic assessment. The lecturer, the lecturer's assistant, and the parents summarised and concluded what they learnt together from the assessment activities, and planned for future improvement.

- Element 3: Success Factors. There are two sub-elements facilitating success of the autistic students. Factor 1 is accommodation, and Factor 2 is success facilitator. Accommodation was divided into two components, which were teaching and learning, and learning media or tools. Teaching and learning referred to daily and weekly learning plans, weekly learning monitoring, remedial learning, flexibility in learning schedule, assistance provided by the lecturer's assistant when needed, availability for advice by the lecturer, and easy access to useful learning media of learning topics. The assessment process itself helped facilitate success of the authentic assessment. The flexibility in assessment and assessment feedback together with assessment tools facilitated success of the autistic students. Alphabet size, arrangement of questions and choices on the same sheet, a friendly testing-room supervisor, reading of some test items to the students, additional explanation for some lengthy questions, explanation of some newly technical terms in the test, summary of some lengthy questions, permission allowing the students to write on the test paper, arrangement of a specific room for autistic testing, and permission for intermission during the test were some of the accommodating approaches provided. Some other factors that facilitated success of autistic students include testing guides, training and preparation of autistic students, and the people involved in the assessment. The follow-up meetings between lecturer, lecturer's assistant, parents and students also helped improve the success level of the authentic assessment.

iii. Results of the implementation of the authentic assessment process.

- Progress assessment of the volunteer students.
  The post-test scores of the three volunteers were higher than those of the pre-test scores. Focusing on individual activity, Volunteer 2 passed Test 1 at his first attempt and could proceed to the subsequent topic. Volunteers 1 and 3 could not make it and were given feedback for improvement. They finally passed the test in their second attempt and could proceed to the subsequent topic. In Test 2, Volunteers 1 and 2 passed the test at their first attempt, but not Volunteer 3. Volunteer 3 was given some feedback for improvement but he was not willing to make a second attempt. The researcher and lecturer discussed the matter and decided to adopt a new assessment approach. Instead of using the essay test, an oral test was given to Volunteer 3, and he did better in the second approach and passed the test as shown in Table 1.

Table 1

Showing Results of the Assessment of the 3 Volunteers

Activities	Type of tests		Volunteer		
			Volunteer 1	Volunteer 2	Volunteer 3
Self- assessment	Multiple choice	Pre-test	10	6	4
(Full Score – 10)	questions	Post-test	10	7	7
Test 1 Results	Essay test	First attempt	16	25	12
(Full Score – 35)	Essay test	Second attempt	25	-	20
Test 2 Results	Essay test	First attempt	30	27	17
(Full Score – 40)	Oral test	Second attempt	-	-	28

Note: The passing score for Test 1 was 15 or above, and the passing score for Test 2 was 20 or above.

- The following four steps were used in the implementation of the authentic assessment process for the students with Asperger Disorder:
  Planning and preparation for the implementation of learning activities and authentic assessment of the students with Asperger Disorder. The lecturer implemented the following six activities: 1) setting objectives and goals of the assessment, 2) setting the scope for assessment, 3) developing the learning plan, 4) developing the assessment tools, 5) setting assessment criteria, and 6) preparing the physical learning environment. In the setting of goals and objectives, the lecturer was able to set goals and objectives of the authentic assessment in congruence with learning goals and objectives through a close consultation with the researcher. In setting the scope for assessment, it was found that the lecturer was not familiar with authentic assessment techniques. Therefore, close consultation between the lecturer and researcher was frequently conducted. The lecturer was not knowledgeable about students with Asperger Disorder, therefore the assignment of a student specialist for this study was necessary. With the assistance of the student specialist in preparing the learning plan, the lecturer was able to carry out the plan successfully. With regards to the development of the assessment tool, the lecturer was very keen to develop the tool for assessing the cognitive domain, but not in the affective and psychomotor domains. A closer working relationship between the researcher and the lecturer helped to develop tools for the assessment of affective and psychomotor domains. The lecturer had no difficulty in setting the assessment criteria and followed the university guidelines. The lecturer and researcher then worked together to develop the physical learning environment and learning media for the volunteers.

  Implementation of the learning plan. It was found that the lecturer was not able to explain to the volunteers on what, how, when, and why the activities in the learning plan were conducted since he was not familiar with them. The lecturer was supported by the researcher who explained the learning plan to the volunteers and lecturer, and monitored the assessment activities regularly.

  Assessment of the learning plan. It was found that the lecturer assessed and provided feedback to the volunteers as planned, and that the volunteers could improve their performance within the limited time frame.

  Learning feedback was given to the volunteers right after each assessment, and the feedback significantly helped improve their performance. The flexible assessment together with some aid and testing facilities according to the needs of individuals with Asperger Disorder also helped improve their performance. The parents suggested that a clear learning plan with specific activity guidelines and timelines together with consistent performing behaviour on learning activities and consistent monitoring helped to improve the volunteers' learning accountability and their punctuality in performing learning activities.

Further Discussion and Recommendations

The following further discussion of some findings of the study:

i. Through the study, it was found that STOU had no specific assessment process for autistic students; the university adopted a conventional approach in assessing them. The summative final exam format had been used for years, though it might not be suitable for autistic students. This finding was in accordance with Kluth (2010), who stated that merely a final exam assessment could not truly reflect an autistic student's learning and competency. Authentic assessment was the approach that could truly

reflect the autistic student's learning, which provides flexibilities and alternatives in assessment. The finding was also in congruence with the findings of Boman et al. (2008), and Wanjiru and Mwendo (2018), who stated that authentic assessment could assure all aspects of student learning.

In the past, STOU did not really have a specific assessment process for autistic students. However, the university did provide some aid and physical facilities to help autistic students cope with their learning impediments. This is congruent with Ontario Ministry of Education's practices (2007), which stated that higher education institutions should provide appropriate learning accommodation to autistic students. An important teaching, learning and assessing strategy could help maximize autistic students' potential. Accommodation referred to by the Ministry included some explanation about the test instruction, the provision for additional time, and the use of appropriate testing tools. This latter finding was also congruent with the findings of the study done by Ketterlin-Geller and Johnstone (2006), who recommended that higher education institutions provide accommodation to all students, including the disabled. The accommodations provided were really helpful to autistic students in performing the tests.

ii. The authentic assessment process of autistic students consisted of three elements.

- Element 1: the authentic assessment design.

  The authentic assessment design was sub-divided into two parts, i.e., 1) the identification of the assessment objectives, and 2) the development of learning activities that promoted authentic learning. The assessment objectives should cover all aspects of student learning, including the cognitive, affective, and psychomotor domains, which was congruent with recommendations by the Vocational Education Commission (VEC, 2013). The VEC stated that an authentic assessment should focus on the students' learning progress, covering cognitive, affective, and psychomotor domains. The learning activities should promote the students' authentic learning, which is congruent with Thumthong (2013), who stated that teaching, learning and assessing were related. Students should learn authentically and be assessed authentically. Identification of the assessment tools. The assessment tools should be able to assess all aspects of student development, i.e., cognitive, affective, and psychomotor, which is congruent with Villamero's (2014) and Overton's (2012) findings. Both stated that various types of assessment should be used in assessing students with special needs. For example, testing, observation, portfolio, and collaborative works should be used in assessing special-needs students, which is congruent with Boman et al.'s findings (2008). This suggested that the lecturer should use various techniques in assessing autistic students. Marking techniques. The lecturer needed to adopt marking criteria that serve the learning and assessment objectives. The assessment should lead to the improvement of student learning. Criteria for the authentic assessment. The assessment criteria referred to detailed guidelines for the assignment of marks to a particular activity/answer. The level of success in performing an activity or in giving the right answer to a particular question should determine the amount of mark assigned to a particular item, which is congruent with Bubpa (2014), who stated that the marks assigned to a particular answer should reflect a student's learning level as well as his/her literacy level in the subject content. The difference in marks should also be able to differentiate between the high, average, and low achievers. The role of involving personnel. The involving personnel were numerous, including university administrators, lecturers, students, and parents. Individual participants assume different roles, which are consistent with the findings of Pasiphol et al. (2015), who stated that a

number of university personnel were involved in the assessment. This is also consistent with Wanjiru and Mwendo (2018), who found that supporting individuals in the assessment of autistic students included lecturers and parents. Further, this finding is also consistent with the finding of the Special Education Bureau and Office of the Basic Education Commission (2015).

- Element 2: Implementation of the Design.

  Planning and preparation for teaching, learning, and authentic assessment. The activities included in this sub-element are congruent with activities suggested by Watthanakuljaroen (2004), who authentically assessed the learning of students in an electronics class and found that the lecturer adopted situational assessment in assessing situational teaching and learning. Implementation of the plan. The lecturer needed to explain to the students what, when, and how to perform different activities included in the plan. The students were advised to perform activities according to their interests and aptitudes. The lecturer and lecturer's assistant facilitated student learning. They regularly monitored students while engaging in the planned activities and giving feedback to their students. This was to assure that their students had mastered the content, which is congruent with Ratanaphan (2016), who stated that learning activities for autistic students must be clearly classified into steps that allowed them to perform one step at a time. The activities should allow for success so that even a little success could motivate students to invest more effort in learning. Assessment of the implementation. The lecturer assessed the students according to the learning plan, and regularly provide feedback for higher efficiency in their learning performance, which is congruent with the findings of Ontario Ministry of Education (2007), which suggested that the lecturer provides to the student alternate learning activities for higher success. Summary and conclusion of the authentic assessment. The lecturer, lecturer's assistant, and parents collaboratively summarised and drew conclusions on what they learnt from the study for future planning, learning, and assessing activities. This finding is congruent with the finding of the study conducted by Ontario Ministry of Education (2007), which found that an efficient assessment was one that was done continuously, with a systematic data collection system, and systematic monitoring mechanism that could lead to efficiency in student learning improvement.

- Element 3 - The Condition and Mechanism Facilitating Success.

  Accommodation consisted of 1) teaching activities and learning media, and 2) learning assessment. The lecturer helped and facilitated the learning of the autistic students by preparing learning plans, monitoring their learning progress, and providing additional learning media. However, the condition and mechanism provided should not be more than what were really needed. The condition set should fit with the needs of the autistic students. This was congruent with the findings of Ratanaphan (2016), Hees et al. (2015), Phonapichat (2016), and Sarrett (2018). It was also congruent with Vidhayasirinun (2012), who found that tests for autistic students should be easily understood, clearly written, and with no deviations. The above findings are congruent with Na Nakorn et al. (2016), who reported that the appropriate reduction in the number of test items allowed the autistic students to have more testing time.

  The authentic assessment design discovered in this study was implemented with three informants and assessed according to the characteristics of their Asperger Disorder. The finding might not be able to draw conclusion from this study. However, it did provide valuable information to the STOU administration.

iii. Through the implementation of the developed assessment process, it was found that the autistic students had improved satisfactorily, which was in congruence with Boman et al. (2008), who found that an authentic assessment was an effective approach for autistic students. This assessment allowed for the assessment of all aspects of student development. It was also useful for the development of individual learning plans. This was in congruence with Watthanakuljaroen (2004), who found that authentic assessment helped increase post-test scores of the students. The above findings were also in congruence with Vipanna (2005), who studied the authentic assessment process and found that the three learning domains of the participants, which included cognitive, process skills, and desirable characteristics, increased at the “passing”, “continuous improvement”, and “very satisfactory” levels respectively.

The following are recommendations that follows the findings and discussions in this study:

i. Adoption of the authentic assessment, where the institute may start with a pilot project, and incorporate some form of research and development in the project. Researchers should participate in the project so that STOU can revise the project activities on-site to improve efficiency. This can easier publicise the project to external parties.
ii. Implementation of the authentic assessment process, whereby the process needs cooperation from a number of participating agencies, such as the administration, lecturers, and the supporting agency of the disabled. These supporting agencies can make physical facilities, such as the school building, testing room, office personnel and testing room supervisor, budgeting, learning media and other learning facilities conducive to the autistic students.
iii. Adoption of the authentic assessment process, should begin with the institute properly explaining to all participating personnel the steps in the adoption of an authentic assessment process as well as its benefits. The lecturer, lecturer’s assistant, parents, and students should be properly informed about the process as well. This will help all parties involved gain some confidence in the authentic assessment process for autistic students.
iv. The arrangement of physical learning facilities suitable with the autistic types of the students, such as alternating written and oral exams, could allow the student to demonstrate his/her true learning. Finding in this study implies that higher education institutes should arrange for appropriate facilities and mechanisms that can help autistic students achieve their learning goals. Different types of autistic students expect different types of facilities and supporting mechanisms.
v. Promotion of the authentic assessment process for autistic students by relevant policymakers focused on different types of the autistic spectrum. Each should be assessed authentically.
vi. Suitable assessment process for the high-functioning autistic individual, but not with other groups. The results of this study might not be applicable all types of autistic students, each with different manifestations of his/her disorder.

Conclusion

The purpose of this study was to develop an assessment process for students with Asperger Disorder at STOU. Four sample groups selected. The data collected comprised qualitative and quantitative data, and appropriate statistical techniques were used accordingly. The study found that STOU adopted a regular assessment approach in assessing students with Asperger Disorder. There had no specific assessment approach for the autistic. In this study, the assessment process for students with Asperger Disorder consisted of three major elements. Element 1 was the design of authentic assessment, which consisted of five sub-elements, including planning for authentic assessment, identification of authentic

assessment tools, student marking techniques, criteria for assessment, and roles of involved personnel. Element 2 was the implementation of the authentic assessment plan, which consisted of four sub-elements, including planning and preparation for the teaching, learning and assessment activities, implementation of the planned learning activities, assessment of the implementation, and summarisation and conclusion of the authentic assessment. Element 3 was the condition and mechanisms facilitating success. This element consisted of two sub-elements, which included learning accommodation and mechanisms leading to success, and the use of authentic assessment tools with autistic students to help improve their learning improvement. The latter includes the provision of regular feedback following individual learning activities, and the use of flexible assessment tools suitable with the students' autistic types.

Acknowledgement

The research was partially funded by THE 200th Anniversary of Sukhothai Thammathirat Open University (STOU) Fund Rattanakosinsompoch Endowment Fund. Many thanks are also presented to the Fund administration.

Ethical Considerations

The study was ethically reviewed by the Ethical Review Committee for Research in Human Subjects, Ministry of Public Health, Thailand (Protocol Number: Ref. No.18/2561)

References

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1999). *Standards for educational and psychological testing*. American Educational Research Association.

Boman, M., McMaine, S., & Fine, R. (2008). *Authentic assessments for individuals with autism spectrum disorders.* TopSCHOLAR®. Retrieved August 26, 2020, from http://digitalcommons.wku.edu/kte/7

Bubpa, S. (2014). *Inclusive education.* Faculty of Education, UdonThani Rajabhat University.

Burke, K. (2009). *How to assess authentic learning* (5th ed.). Corwin.

Durocher, J. S. (2010). Assessment for the purpose of instructional planning for students with autism spectrum disorders. In A. E. Boutot & B. S. Myles (Eds.), *Autism spectrum disorders: Foundations, characteristics, and effective strategies*. Prentice Hall.

Elsworth, S. (2017). *Definition of authentic assessment & why it is useful with students with special needs*. Retrieved January 12, 2021, from https://zhort.link/pFB

Hees, V. V., Moyson, T., & Roeyers, H. (2015). Higher education experiences of students with autism spectrum disorder: Challenges, benefits and support needs. *Journal of Autism and Developmental Disorders, 45*, 1673–1688.

Hepburn, S., Kaiser, K., & Graham, M. (2015). *Guidelines for the educational evaluation of autism spectrum disorder.* Colorado Department of Education, University of Colorado.

Hepburn, S., Kaiser, K., Graham, M., Katz, T., & Johnson, D. (2018). *Guidelines for the educational evaluation of autism spectrum disorder.* The Office of Special Education, Colorado Department of Education.

Ketterlin-Geller, L. R., & Johnstone, C. (2006). Accommodations and universal design: Supporting access to assessments in higher education. *Journal of Postsecondary Education and Disability, 19*(2), 163–172.

Kluth, P. (2010). *"You're going to love this kid!" Teaching students with autism in the inclusive classroom*. Paul H. Brookes.

Ministry of Social Development and Human Security. (2012). *The ministry of social development and human settlement promulgation regarding types and criteria of the disable (2nd Revision)*. Government Gazette. 2012 July (12d, 119d), 22–23.

Na Nakorn, N., Ngudgratoke, S., & Chutinuntakul, S. (2016). *Optimal test length for the assessment of students with autism in distance education* (pp. 127–130). The 10th International Conference on "Reveal the Autistic World", Khon Kaen University.

Office of the Higher Education Commission. (2010). *The higher education commission promulgation regarding the promotion of higher education for the disables.* Retrieved August 26, 2020, from https://zhort.link/pFI

Office of the Higher Education Commission. (2012). *A training guide on the development of personnel involving in the delivery of education services to disable students in higher education institutes. Unique considerations for special needs of students with autism and invisible disabilities.* Retrieved August 26, 2020, from shorturl.at/lwNSV

Office of the Royal Society. (2012). *The royal institute education dictionary.* Arun Printing Ltd., Part.

Ontario Ministry of Education. (2007). *Effective educational practices for students with ASD*. Retrieved August 26, 2020, from https://zhort.link/pFM

Overton, T. (2012). *Assessing learners with special needs: An applied approach* (7th ed.). Merrill.

Palmer, N. (2005). *Realizing the college dream with Autism or Asperger Syndrome: A parent's guide to student success.* Jessica Kingsley Publishers.

Pasiphol, S., Lawthong, N., & Tangdhanakanond, K. (2015). *Measurement and evaluation of learning*. Chulalongkorn University Press.

Phonapichat, P. (2016). *Optimal test length for the assessment of students with autism in distance education* (pp. 135–141). The 10th International Conference on "Reveal the Autistic World", Khon Kaen University.

Ratanaphan, J. (2016). *How to prepare for the teaching of the autistic?* Chulalongkorn University Press;

Rovinelli, R. J., & Hambleton, R. K. (1977). On the use of content specialists in the assessment of criterion-referenced test item validity. *Dutch Journal of Educational Research, 2*, 49–60.

Sarrett, J. C. (2018). Autism and accommodations in higher education: Insights from the autism community. *Journal of Autism and Developmental Disorders, 48*, 679–693.

Special Education Bureau & Office of the Basic Education Commission. (2015). *A guideline for the assessment of students with special needs.* National Office of Buddhism.

Stiggins, R. J. (1987). The design and development of performance assessment. *Educational Measurement: Issues and Practice, 6*, 33–42.

Sukhothai Thammathirat Open University. (2013). *A workshop report on the development of support services for autistic students*. Retrieved August 26, 2020, from shorturl.at/lJOQ8

Thumthong, B. (2013). *Theories and development of instructional model.* S. Printing Thai Factory Press.

Thurlow, M. L., & Quenemoen, R. F., (2016). Alternate assessments for students with disabilities for student: Lessons from the national center and state collaborative. In C. Wells & M. Faulkner-Bond (Eds), *Educational measurement: From foundations to future*. Guilford.

Vidhayasirinun, S. (2012). *An assessment of special need students. A compilation of texts and learning management for the disable* (Vol. 10). Nonthaburi: School of Educational Studies, Sukhothai Thammathirat Open University.

Villamero, R. J. (2014). *Teachers' assessment strategies for children with disabilities: A constructivist study in regular primary schools in Negros Oriental, Philippines* [Master's thesis, University of Oslo]. Department of Special Needs Education, Faculty of Educational Sciences.

Vipanna, D. (2005). *The development of the authentic assessment process: A course in statistics for graduate diploma in business management at a college of physical education.* [Master's thesis, Khon Kaen University]. Faculty of Education, Department of Educational Measurement and Evaluation.

Vocational Education Commission. (2013). *The authentic assessment process.* Supervisor Bureau, Vocational Education Commission.

Wanjiru, W. D., & Mwendo, M. C. (2018). Teachers' views towards academic assessment for learners with autism: A case study of city primary school in Nairobi County, Kenya. *Msingi Journal, 1*(2), 1–28.

Watthanakuljaroen, T. (2004). *Development of authentic assessment model in e-learning by using situated learning for enhancing self-efficacy of students in higher education level students* [Doctoral dissertation, Chulalongkorn University]. Faculty of Education, Department of Curriculum and Educational Technology.

Wiggins, G. P. (1993). *Assessing student performance.* Jossey-Bass Publishers.