Development of Anxiety Instruments

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Received Month 2020-08-02; Revised Month 2020-10-26; Accepted Month 2020-10-19; Published Online 2020-10-31

Conflict of Interest
Disclosures:
The authors declare that they have no significant competing financial, professional or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

Abstract: This research was conducted to determine the validity and reliability of developing academic anxiety scales on students. The method used is research and development (research and development). The research design used in this study is a 4-D (four D models) research design, which includes 4 stages: define, design, develop, and disseminate. But the disseminate phase was not carried out because of the COVID-19 pandemic. The subjects in this study were experts or experts in the field of Counseling Guidance and lecturers from other faculties. In this study, validation was carried out by 5 experts who were experts in their fields, consisting of 3 lecturers of the Undiksha Guidance and Counseling Postgraduate Program, 1 lecturer from the Faculty of Medicine and 1 lecturer at the Faculty of Language and Literature. Data analysis to test the validity of anxiety instrument product contents using the Lawshe CVR and CVI formulas. The results of the research based on content validity analysis are the CVR values per item obtained > 0. Furthermore, the results of the Lawshe CVI analysis obtained a score of 0.817. This value means that the content validity index of 60 items in this anxiety instrument is very good. Reliability test with Alpha Cronbach which is calculated manually using Microsoft Excel 2010 for Windows. Obtained a reliability coefficient of 0.896. This shows that the level of reliability of instrument anxiety is high. The researcher recommends that further researchers be able to develop anxiety instruments in addition to academic anxiety experienced by students. Suggestions for lecturers/instructors so that this instrument can be used to determine the level of anxiety experienced by students.

Keywords: instrument development, anxiety, research&development

Introduction
The thought process of every person occurs from birth and is stored in memory. In everyday life humans experience the process of thinking in carrying out an activity. Each individual has a different thought process between one and the other. Humans living in this world have desires and hopes. Not all wishes and hopes of a person can be realized. Situations where when the desire is not realized, can cause problems for someone (Sevgi & Arslan, 2020). Human responses when experiencing various unpleasant situations or conditions, most often experienced is anxiety. Where this anxiety is very disturbing someone's life (Asrori, 2015).

Anxiety is an aspect that can be experienced by all humans. Where anxiety can not be avoided from human life (Mahajan, 2015). According to the Big Indonesian Dictionary, anxiety is a condition that makes...
a person not at peace (because of worry, fear); restless (KBBI web). There are some experts who put forward the theory of anxiety. According to Syamsu Yusuf, 2009 (in Annisa & Ifdil, 2016) suggests that anxiety is a neurotic helplessness, insecurity, immature and inability to face the demands of reality (environment). Anxious according to Sarlito Wirawan Sarwono, 2012 (in Annisa & Ifdil, 2016) is a feeling of fear that has no clear object and no clear reason.

Sigmund Freud (in Corey, 2005) explains that anxiety is a tense state that motivates someone to do / do something. According to the existential approach (in Corey, 2005), anxiety is a person's reaction to a threat. Anxiety attacks the core of existence. Anxiety is what is felt when self-existence is threatened (Corey, 2005). Putnam (2010) defines anxiety as a complex psychological condition that affects a variety of cognitive, behavioral, and psychological conditions (Mahajan, 2015). According to the American Psychiatric Association, 2000; Barlow, 2002 (Burlow & Durand, 2012), anxiety is a state of negative feelings characterized by physical symptoms of physical tension and worries about the future. Sigmund Freud classifies anxiety into three types namely real anxiety, neurotic anxiety and moral anxiety (Sevgi & Arslan, 2020).

Anxiety can be felt by anyone, anytime and in any condition / situation. Anxiety is felt from all ages, both children, adolescents, adults and even the elderly. College period is a transition / transition from adolescence to adulthood. While in college, students not only have an assignment to study, but they have already begun to think about their future. The many changes experienced by a person at this time cause students often experience psychological disorders, where psychological disorders that are often experienced by students are anxiety (Hasianna, S. T., Surawaiya, A. K., Maulana, T. A, 2014). According to the American College Health Association, 2018; Zivin et al., 2009 (Rith-Najarian, Boustanli, & Chorpita, 2019), high-risk students experiencing depression and anxiety.

In pursuing education, students are faced with various college assignments. There are two types of reactions given by students when facing exams and academic assignments, namely negative and positive affective reactions that affect the circumstances and learning activities of students (Dharsana, 2014). As has been proven by Raudah, Budiarti, and Lestari (2015) that negative affective reactions such as stress will cause a decrease in enthusiasm for learning and tend to avoid academic tasks (Vivin, Marpaung, & Manurung, 2019).

There are several things that affect student anxiety on campus. According to Rosmawati, 2017 (Apriliana, Suranata, & Dharsana, 2019), specifically, there are two factors that affect student anxiety, namely internal and external factors. According to Liebert and Morris, 2007; Zeidner, 2007; Goetz et al, 2008 (Gogol, Brunner, Preckel, Goetz, & Martin, 2016), said that academic anxiety refers to feelings of worry and nervousness and anxiety related to the achievement of situations in a school context. Meanwhile, according to (Mahajan, 2015), academic anxiety is a change that occurs in response to exposure to stressful academic situations, such as completing schoolwork, presenting projects in class or taking an exam.

According to Otten, 1991 (Pemrata & Widiasavitri, 2019) academic anxiety is an important issue that will affect a large number of students. Putwain, Connors, and Symes (2010) revealed that academic anxiety will affect 3 aspects in students, namely: cognitive, physiological-affective and behavior. Rana & Mahmood (2010) also revealed that anxiety will affect the cognitive and affective students. Libert & Morris (1967) states that academic anxiety will cause physical discomfort such as nausea, dizziness and sweating (Firmantyo & Alsa, 2017). According to educational psychology, there are 3 levels of academic anxiety (Rehman, 2016), namely mild, moderate and severe academic anxiety. Eysenck (1992) said that individuals who experience anxiety will experience interference with information processing. Meanwhile, according to Shell & Husman (2008), individuals who experience anxiety also have self-doubt about their ability to manage threatening situations and lack of confidence in their abilities (Cheng & McCarth, 2018). According to Situmorang 2017 (Dominikus David Biondi Situmorang, Mulawarman, & Mungin Eddy Wibowo, 2018) if this anxiety continues it will cause negative symptoms in physical and psychological aspects. High levels of academic anxiety can interfere with one's concentration and interfere with memory on a given task so that it can hinder one's success (von der Embse, Scott, & Kilgus, 2015).

Every individual experiences anxiety at different levels, from the unseen to excessive fear (Misdeni, Syahnia, & Marjohan, 2019). Yanti, Erlamsyah, Zikra, & Ardi (2013), stated that low-level academic anxiety tends to arouse student enthusiasm for learning. However, when anxiety is high, it leads to various physical and psychological disorders (Taty, 2020). Because of this, it is important to know the level of academic anxiety experienced by students. To be able to know the level of academic anxiety experienced by students, there needs to be instruments that can measure the anxiety felt by students. The research instrument is a tool used to measure observed natural and social phenomena (Sugiyono, 2018).
There are several anxiety instruments that are often used to measure anxiety experienced by someone such as the HARS (Hamilton Anxiety Rating Scale) questionnaire, TMAS (Taylor Manifest Anxiety Scale), Spielberg's Anxiety Test Inventory, Zung Self Rating Anxiety Scale (ZSAS). The HARS (Hamilton Anxiety Rating Scale) instrument is a measuring tool to determine the level of anxiety experienced by a person. The HARS instrument was first used in 1959, which was introduced by Max Hamilton (in Vivin, Marpaung, & Manurung, 2019). The validity of this questionnaire was tested with a range of r values of 0.39 to 0.79 and Alpha Cronbach's value of 0.948 (Hamdiah, Suwondo, Sri Hardjanti, Soejoenoes, & Anwar, 2017). HARS is a measurement of anxiety based on the emergence of symptoms / symptoms from individuals experiencing anxiety, which includes 14 items, each categorized by a series of symptoms, and measures mental agitation and psychological distress, as well as physical complaints related to anxiety (Hallit et al., 2020 ). TMAS (Taylor Manifest Anxiety Scale) compiled by Taylor (1953) consists of 50 items. The TMAS instrument consists of 2 aspects of anxiety namely physiological and psychological aspects. Zung Self-rating Anxiety Scale (ZSAS) focuses on somatic complaints that represent anxiety symptoms.

Anxiety instruments are widely available and have been tested for validity and reliability. But not necessarily right and may not be valid and reliable again if used for a particular place. This needs to be understood because social phenomena / phenomena are rapidly changing and are difficult to find in common. To be able to handle anxiety problems experienced by students, it is very important to determine the accuracy of the instruments used in identifying the level of anxiety felt. For this reason, in this study the author wants to study, compare, and at the same time develop relevant instruments that can be used to analyze the anxiety phenomena experienced by students. The development of relevant and appropriate instruments will be used as a basis in providing methods of handling the anxiety problem will be easier and optimal.

**Method**

This research uses research and development methods. The subjects in this study were experts or experts in the field of Counseling Guidance and lecturers from other faculties. The expert or expert is the Guidance Counseling lecturer at Ganesha University of Education, lecturer from the Faculty of Medicine, lecturer from the Language and Arts Faculty. The variable in this study is anxiety. The operational definition in this research is anxiety which is an emotion that is felt by someone consisting of thoughts, sensations, and unpleasant behavior / actions, as well as uncomfortable physical changes, which can be used as a warning against a threat or danger. There are 4 aspects in the development of this anxiety scale instrument, namely: aspects of the mind, aspects of sensation / emotional, behavioral aspects and physical aspects.

The research design used in this study is a 4-D (four D models) research design, which includes 4 stages, namely the define, design, develop, and disseminate stages. The first stage is define, at this stage the researcher analyzes the needs of product development, analyzes the characteristics of the target subject of measurement, as well as theoretical and empirical literature studies to find the concepts of the variables developed namely anxiety. The second stage is design, at this stage what is done is to design academic anxiety instrument design for students. The preparation of this design is guided by the results of the analysis conducted at the define stage. Prior to the preparation of the instrument, it must be arranged systematically and in a structured manner. The instrument was designed starting from (1) concept definition; (2) operational definition; (3) aspects; (4) louvers; (5) questions / statements and (6) assessment forms. The third stage is develop (development), in this research is the stage of developing research products. Development is based on the theories of experts and instruments of pre-existing anxiety. Furthermore, to determine the feasibility of the academic anxiety instrument on these students, an expert test was conducted by five (5) experts in their respective fields. After getting input and evaluation from the experts, then some improvements were made to improve the research instruments from several aspects such as the use of appropriate sentences, the suitability of the items with the observed indicators.

The instrument used in this study was an anxiety instrument, for data collection methods used an anxiety questionnaire instrument. This instrument is divided into 4 aspects and broken down into 19 indicators. The total number of statements in the expert validation instrument for this anxiety instrument is 60 items. Scoring of the respondent's answer items is the range of numbers from 0 to 4, the smallest number, 0 representing symptoms never felt, and the largest number, 4 representing symptoms often felt. The product developed is then tested for eligibility. According to Carmines & Zeller, 1979 (Shrotryia & Dhanda, 2019), validity ensures that assessment instruments measure what they want to be measured. Validity test uses the Formula Lawshe test (1975). Lawshe's CVR (Content Validity Ratio) is one of the most widely used methods to measure...
The measurement of the anxiety instrument developed involved 5 experts / practitioners who were experts in their fields. The data analysis technique used is the Lawshe CVR and CVI formulas, with the formula:

The formula for calculating CVR is as follows:

\[
CVR = \frac{ne - N/2}{N/2}
\]

Information:
- \( CVR \) = Content Validity Ratio
- \( n \) = the number of experts who answer "essential" or "important"
- \( N \) = the total number of experts

The criterion of validity of whether the contents of the item is valid uses the minimum CVR reference value based on the number of panelists involved in the assessment of the instrument being developed. This formula produces values that range from +1 to -1, positive values indicate that at least half the panelists rate items as important. The greater the CVR is from 0, the more "important" and the higher the content validity. After getting the CVR value, then proceed with calculating the CVI (Content Validity Index). The CVI calculation is the average CVR value for all items. To calculate the CVI the following formula is used:

\[
CVI = \frac{\sum CVR}{k}
\]

Information:
- \( CVI \) = Content Validity Index
- \( \sum CVR \) = total content validity ratio
- \( k \) = number of items

According to Lawshe, the criteria for a good CVI index scale are scores above 0.50. Meanwhile, if the CVI value obtained > 0.90 to 1 it is a special CVI index. After the validity coefficient is obtained, then the reliability calculation is performed, using the Cronbach Alpha formula as follows:

\[
r_1 = \left( \frac{k}{k-1} \right) \left( 1 - \frac{\sum \sigma_i^2}{\sigma_r^2} \right)
\]

\( \sum \sigma_i^2 \) = jumlah varians butir
\( \sigma_r^2 \) = varians total

Results and Discussion

This research is a research with the type of Research and Development (R & D) with the instrument developed is an academic anxiety scale on students. The research model used in this study is a 4-D development model (four D models), which includes 4 stages, namely define, design, develop, and disseminate. However, the dissemination stage was not carried out because it considered several things related to health problems due to the presence of a COVID-19 pandemic.

a. define

At this stage the researcher analyzes the need for product development, namely the development of an anxiety scale instrument that can be applied among students. Where anxiety can be used as a warning against the threat of danger to students. Anxiety in low levels is needed as motivation, control devices, introspection, before important events occur. But if anxiety is not mastered can cause feelings of horror.
and worry for no apparent reason. Then, researchers conducted a study of theoretical and emperic literature to find the concepts of the variables developed namely anxiety.

b. design
The activity carried out in this stage is to design academic anxiety instruments for students. The preparation of this design is guided by the results of the analysis conducted at the define stage. Prior to the preparation of the instrument, it must be arranged systematically and in a structured manner. The instrument was designed starting from (1) concept definition; (2) operational definition; (3) aspects; (4) loupers; (5) questions / statements and (6) assessment forms.

c. develop
The third stage in this research is the stage of developing research products. Development is based on the theories of experts and instruments of pre-existing anxiety. Furthermore, to determine the feasibility of the academic anxiety instrument on these students, an expert test was conducted by five (5) experts in their respective fields.

After getting input and evaluation from the experts, then some improvements were made to improve the research instruments from several aspects such as the use of appropriate sentences, the suitability of the items with the observed indicators. The assessment instrument used was a questionnaire consisting of 60 statements. Based on the calculation of the CVR index on each item, it can be seen that of the 60 item items on the instrument, all of them meet the validity index. These results indicate that the items on the anxiety instrument developed have validity based on the CVR index test. After getting the CVR value, then proceed with calculating the CVI (Content Validity Index). The CVI calculation is the average CVR value for all items. From the calculation results, the CVI value results from anxiety instruments based on the assessment of 5 experts amounted to 0.817. This value means that the content validity index of 60 items in this anxiety instrument is very good. The next feasibility test conducted was the calculation of the reliability test with Alpha Cronbach which was calculated manually using Microsoft Excel 2010 for Windows. Obtained a reliability coefficient of 0.896. Where namely \( r_{xx} > r_{table}, 0.896 > 0.878 \) with a percentage of 5%. This shows that the level of reliability of instrument anxiety is high.

The results showed that academic anxiety instrument products for students were important to be developed, based on the results of content validation data analysis by experts obtaining agreement between assessors about the importance of anxiety instrument products. The product is designed to know the level of anxiety experienced by students, especially in the academic field. The results of this study are in accordance with the results of this study in accordance with research conducted by Dini Eka Angraini, et al in 2019 entitled "Anxiety Scale Facing College Entrance Tests". Where aspects of anxiety are divided into: a) Physiological aspects experienced during the test situation, including feeling dizzy and feeling nauseous. b) The emotional aspect. As a self-reaction to autonomic nerve stimulation, including experiencing cold sweat, feeling tense, feeling faster heart palpitations, and feeling panic. c) Cognitive. In this case the cognitive aspect refers to worry. Worrying is negative thoughts about something bad that might happen in the future. In the form of worrying thoughts: (a) self-competence (including ability, knowledge, and test preparation), (b) test demands (amount of material, difficulty, and time pressure), (c) do the test as expected, (d ) feeling anxious about the consequences of the test results, (e) reviewing the performance on previous tests that are similar, (f) interpreting the test scores and material, (g) demanding honesty in the test. The results of the study are based on the results of the assessment using the content validity coefficient of Aiken's V, from 136 items found 68 items that have a value of V <0.6 which means the item is bad, so the number of questions used is 68 items only. Reliability test conducted with the help of IBM SPSS Statistics 20 obtained a coefficient \( \alpha = 0.920 \) so it was stated that the anxiety scale facing the college entrance test was very good because the coefficient value was more than 0.9 (Angraini, Latifah, Yuliani, Rahmani, Arina, & Husna, 2019).

Conclusion
Based on the results of research and discussion that has been done, the following conclusions can be drawn; First, this research and development resulted in an instrument in the form of developing academic
anxiety instruments for students. The research model used in this study is a 4-D development model (four D models), which includes 4 stages, namely define, design, develop, and disseminate. Second, from the results of expert validation, the development of academic anxiety instruments on students has a content validity index (CVI) of 0.817, which means this instrument is very good. The reliability test obtained a coefficient of 0.896. Where $r_{11} > r_{table}$, that is 0.896 > 0.878 with a percentage of 5%. This shows that the level of reliability of instrument anxiety is high. Thus, the academic anxiety scale instrument for students developed in this study fulfills the acceptance criteria that can be used to determine the level of academic anxiety experienced by students. Based on the conclusions of this study, several suggestions can be made as follows. First, the next researcher is able to develop anxiety instruments other than academic anxiety experienced by students. Second, for lecturers / teaching staff to use this anxiety instrument to find out the level of academic anxiety experienced by students. Based on the conclusions of this study, several suggestions can be made as follows. First, the next researcher is able to develop anxiety instruments other than academic anxiety experienced by students. Second, for lecturers / teaching staff to use this anxiety instrument to find out the level of academic anxiety experienced by students.

Acknowledgment
The author would like to thank and appreciate as much as possible for all the help, guidance, and contributions of all relevant parties who have worked hard for the development of this research. The author would like to thank the supervisors of this study, Prof. Dr. I Ketut Dharsana, M.Pd., Kons as the first supervisor, and Dr. Kadek Suranata, S.Pd., M.Pd., Kons as the second counselor who has always given all directions in this study. Next to Prof. Dr. Ni Ketut Suarni, M.S., Kons as the Head of the Undiksha Counseling Postgraduate Program Study Program and at the same time willing to test expert experts, Dr. Dr. Made Kurnia Widiastuti Giri, S. Ked., M. Kes and Putu Adi Krisna Juniarta, S. Pd., M. Pd who have been prepared to test expert experts. As well as all other relevant parties who have provided support until this research has achieved the expected results.

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KBBI web. (n.d.).


Engagement. SAGE Open, 9(1). https://doi.org/10.1177/2158244018821751

Article Information (Supplementary)
Conflict of Interest Disclosures:
The authors declare that they have no significant competing financial, professional or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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https://doi.org/10.xxxx/xxxxx
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Word Count: