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The Assessment of Creative Products in Programs for Gifted and Talented Students*

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Abstract

Formal evaluation of student products completed in programs for the gifted and talented seldom occurs. Few instruments exist for this purpose, and reliability and validity information is not often available for the instruments that do exist. In this article, the development of *Student the Product Assessment Form* is reviewed. A description of the results obtained from content validation procedures, reliability findings, scoring, and interrater agreement and reliability techniques are provided.

I would argue that the starting point, indeed the bedrock of all studies of creativity, is an analysis of creative products, a determination of what it is that makes them different from more mundane products.

Donald W. MacKinnon (1987, p. 120)

Putting the Research to Use

Many students are involved in gifted and talented programs in which they develop products. Evaluation of these products is often not completed or completed in an informal way. If the evaluation of student products were organized and conducted on a regular basis, a record could be kept of this important aspect of student work. The *Student Product Assessment Form* (SPAF) was developed to aid teachers in their evaluation of student products. It has been field tested for several years and has proven to be both valid and reliable. In districts where SPAF is used, a copy of the summary sheet (Figure 1) is included in the permanent record folder of each student who has competed a product that academic year. The accumulated summary sheets provide an overview of all products completed in the gifted program and provide an academic portfolio of a student's creative products.

Donald MacKinnon, a noted researcher in the area of creativity, believes that the criterion by which other facets of creativity should be studied is the creative product (1987). According to

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MacKinnon, the different facets of creativity, which include the creative process, the creative person, and the creative solution, should be defined with reference to the creative product. MacKinnon defines creative processes as those resulting in creative products, creative persons as those who bring creative products into existence, and creative situations as a set of circumstances which permits, fosters, and makes possible creative productions.

Rhodes (1987) expressed similar views on creative products. According to Rhodes, products can present a record of one's thoughts at the moment a new concept is born, and since products are artifacts of thought, the analysis of products can help to reconstruct the mental process of inventing. Thus, investigation into the nature of the creative process can proceed from product to person and then to process and to press (the relationship between human beings and their environment).

The analysis of evaluation of creative products can provide insight into the creative potential of students who participate in gifted and talented programs. It may also provide input into the process which is used to complete products. How can we effectively and fairly evaluate products? How do we determine what it is that makes products creative and different? Amabile (1983) suggests that we must "somehow quantify our notions of what makes a creative product and specify objective means for assessing those qualities …" (p. 26). Because of the difficulties in making strictly objective assessments of creative products, she concludes that, "the assessment of creativity simply cannot be achieved by objective analysis alone. Some type of subjective assessment is required" (p. 27).

Getzels and Csikszentmihalyi (1976); Jackson and Messick (1965); and Sobel and Rothenberg (1980) have discussed the criteria by which products should be judged, agreeing that the major responsibility for assessing the creativity of a product is placed on the values and experience of the judge(s). Usually no specific guidelines are available to those doing the judging. Therefore, the reliability and validity of the judgments can be questioned. Little research has been conducted in the area of product evaluation in gifted and talented programs. This study describes the development of a product rating scale designed for this purpose.

A review of numerous instruments for product and process evaluation of completed student products in a gifted program reveals a paucity of research in this area. Few instruments are available for perusal, and even fewer have been evaluated in terms of reliability, validity, or field test data. Treffinger (1987, p. 114), an expert in creativity, identified 11 major areas of opportunity and concern in the area of creativity assessment, including the need for demonstration of reliability and validity of instruments for evaluating products based on creativity criteria. In a publication compiled by the Council for Exceptional Children (1979) entitled *Sample Instruments for the Evaluation of Programs for the Gifted and Talented*, seven different gifted programs from the United States provided detailed descriptions of their evaluation process. Only one program included product evaluation as one of the program objectives. Fifty gifted programs were contacted as a part of this study, and few used any formal evaluation of student products. Those that did evaluate products used a locally developed form on which students indicated what they had learned by completing their product. Teachers of the gifted indicated that their evaluation consisted of a verbal exchange with the student and that very often no written assessment of the student's product was filed in the student's record.

More recently, product evaluation forms have been developed by Archambault and Gubbins (1980), Callahan (1980), Tuttle (1980), and Westberg (1990). All of these forms have been utilized in research and evaluation studies and will be involved in future field test situations. Tuttle's form was designed to provide a rater with a valid basis for assessing the quality of the work and the implementation of research and communication skills. According to Tuttle, this Product Evaluation Form proved to be a valid and reliable instrument to assess implementation of advanced research and communication skills when used by trained raters. Tuttle also noted that his form is appropriate only for certain types of products: those involving research skills and the sharing of the product with an audience.

Callahan's *Product Evaluation Form* (1980) was specifically designed to evaluate Type III investigations in a gifted program based on *The Enrichment Triad Model* (Renzulli, 1977). Callahan devised the form to determine whether or not the student had familiarized himself/herself with the problems, techniques, methodologies, environment, product, and audience of the interest area that s/he selected for the investigation. No distinction is made between process and product skills in either Tuttle's or Callahan's instruments.

Amabile (1983) advocated the use of a consensual technique for creativity assessment. The major features of the consensual assessment technique are as follows. The task being analyzed should lead to a product or observable response that can be assessed. The task should be open-ended to permit flexibility and novelty in responses, and the task should not be dependent upon certain special skills such as drawing ability or verbal fluency. The assessment procedure as described by Amabile includes five requirements. First, the judges should all have some experience with the domain being assessed. Implied in this requirement is that judges have enough familiarity with the domain to have developed, over a period of time, some implicit criteria for creativity, technical goodness, and so on. The second procedural requirement for the assessment procedure is that judges assess independently. Third, judges are asked to make assessments on other dimensions in addition to creativity. Judges are also instructed to rate the products relative to one another on the dimensions in question as opposed to, for example, the greatest works ever produced in that domain. Last, each judge should view products in a different random order and consider the dimensions being assessed in a different random order (Amabile, 1983, pp. 37–39). Amabile also recommends that each dimension of the instrument used to rate products be analyzed for interjudge reliability.

Westberg (1990) used Amabile's (1983) consensual assessment technique to develop an instrument for assessing the creative productivity of inventions made by elementary and middle school students. Judges regarded as experts in creative productivity used Westberg's *Invention Evaluation Instrument* to evaluate student inventions. A factor analysis of this instrument indicated that the 11 items loaded on 3 factors: originality, technical goodness, and aesthetic appeal. The interrater reliability for the instrument as a whole was 0.96.

Bessemer and Treffinger (1981) discovered similar results regarding the paucity of research in a review of the literature on the characteristics of creative products and subsequently developed *The Creative Product Analysis Matrix* (CPAM). The authors of CPAM proposed that groups of related attributes cluster along three different but interrelated dimensions: (a) novelty, (b) resolution, and (c) elaboration and synthesis. They define novelty as the degree of originality of the product in terms of new concepts, new processes, or new materials used. Resolution of a

product reflects the degree to which a product resolves the problem implied by its creation, and elaboration and synthesis are described as the " … stylistic attributes of the product by focusing on aspects of complexity or elaboration of the product's conception, and the refinement, synthesis and elegance shown in its manifestation" (Bessemer & O'Quin, 1987, p. 342). Additional research was conducted on whether or not subjects would evaluate creative products in a manner consistent with the proposed model. Selecting a variety of creative products, a judging instrument based on CPAM and called the *CPAM Adjective Checklist* was developed which contained 110 adjectives and adjectival phrases describing the three dimensions of novelty, resolution, elaboration and synthesis. Based on this research, 12 subscales were constructed from the 110 different words. Under the dimension of novelty, 3 subscales emerged: original, germinal, and startling. Under the dimension of resolution, 2 subscales emerged: logical and useful. Under the dimension of elaboration and synthesis, 3 subscales emerged: elegant/organic, attractive, and well-crafted. Reliability and validity studies conducted on CPAM are reported by the authors as quite positive. The use of CPAM in the research studies reported in the literature (Bessemer & Treffinger, 1981; Bessemer & O'Quin, 1987) is extremely promising for the evaluation of the creative products of adults.

Development of the Student Product Assessment Form

Content Validity

Description of the Student Product Assessment Form. The first stage in the development of the *Student Product Assessment Form* (SPAF; Reis, 1981) was to outline the content around which the instrument was to be constructed. Toward this end, letters were sent to coordinators of 50 long-established gifted programs throughout the country. Program coordinators and teachers were asked to provide the researchers with any forms or instruments used to evaluate student products. Every response indicated that formal product evaluation rarely occurred; when it did, the instruments used were locally developed and lacked reliability and validity information. Most of the product rating forms were very brief and sketchy, consisting of questions students were asked to answer upon completion of a product, for example, what did you learn by doing this project?

A review of literature was also undertaken in an effort to identify methods of evaluating student products completed in gifted programs. As was pointed out earlier, a shortage of instruments designed for this purpose was found. Few of the instruments available were evaluated in terms of reliability, validity, or field test research. Additionally, all available forms and scales that were examined were either geared toward adult products (Bessemer & Treffinger, 1981); geared to specific products such as inventions (Westberg, 1990); or judged to be sketchy, inadequate, and incomplete for use in the evaluation of gifted students' products.

Based upon the examination of the literature and our years of familiarity with the outstanding products developed by gifted students, a new form was designed (see Summary Sheet for form in Figure 1) to provide raters with a valid and reliable basis for assessing the quality of products completed in gifted and talented programs. Fifteen items were generated which assess both individual aspects as well as the overall excellence of the product. Each item represents a single characteristic on which raters should focus their attention. Items 1 through 8 are divided into three related parts:

Figure 1
Student Product Assessment Form
Summary Sheet

Name (s) _____ Date _____

District _____ School _____

Teacher _____ Grade _____ Sex _____

Product (Title and/or Brief Description) _____

_____

Number of Months Student(s) Worked on Product _____

FACTORS	RATING*	NOT APPLICABLE
1. Early Statement of Purpose	_____	_____
2. Problem Focusing	_____	_____
3. Level of Resources	_____	_____
4. Diversity of Resources	_____	_____
5. Appropriateness of Resources	_____	_____
6. Logic, Sequence, and Transition	_____	_____
7. Action Orientation	_____	_____
8. Audience	_____	_____
9. Overall Assessment	_____	_____
A. Originality of the Idea	_____	_____
B. Achieved Objectives Stated in Plan	_____	
C. Advanced Familiarity with Subject	_____	
D. Quality Beyond Age/Grade Level	_____	
E. Care, Attention to Detail, etc.	_____	
F. Time, Effort, Energy	_____	
G. Original Contribution	_____	

Comments:

Person completing this form:

*Rating Scales: Factors 1–8
5 - To a great extent
3 - Somewhat
1 - To a limited extent

Factors 9A–9G
5 = Outstanding
4 = Above Average
3 = Average
2 = Below Average
1 = Poor

1. *The Key Concept.* This concept is always presented first and is printed in large type. It should serve to focus the rater's attention on the main idea or characteristic being evaluated.
2. *The Item Description.* Following the Key Concept are one or more descriptive statements about how the characteristic might be reflected in the student's product.
3. *Examples.* In order to help clarify the meaning of the items, an actual example of students' work is provided. These examples are intended to elaborate upon the meaning of both the Key Concept and the Item Description. The examples are presented in italics following each item description.

An example of item 4 is included below:

DIVERSITY OF RESOURCES

Has the student made an effort to use several different types of resource materials in the development of the product? Has the student used any of the following information sources in addition to the standard use of encyclopedias: textbooks, record/statistic books, biographies, how-to-do-it books, periodicals, films and filmstrips, letters, phone calls, personal interviews, surveys, polls, catalogs, and/or others?

For example, a fourth grade student interested in the weapons and vehicles used in World War II read several adult-level books on this subject, including biographies, autobiographies, periodicals, and record books. He also conducted oral history interviews with local veterans of World War II, previewed films and filmstrips about the period, and collected letters from elderly citizens sent to them from their sons stationed overseas.

5	4	3	2	1	NA
To a great extent		Somewhat		To a limited extent	

Item 9 has seven different components which deal with an overall assessment of the product. No examples of students' work are provided for item 9. When completing the ratings for the overall assessment of a student's product, raters should attempt to evaluate the product in terms of their own values and certain characteristics that indicate the quality such as aesthetics, utility, and function of the overall contribution. In other words, raters are encouraged to consider the product as a whole (globally) in item 9 and to use their own judgment and rely upon their own guided subjective opinions when rating this item.

Because of the difficulty of developing a single instrument that will be universally applicable to all types of products, instances occur when some of the items do not apply to specific products. For that reason, a category entitled "Not Applicable" was added to the 1–5 Likert-type scale of items 1–8. For example, in a creative writing product (play, poem, novel) either the Level of Resources (item 3) or the Diversity of Resources (item 4) might not apply if the student is writing directly from his/her own experiences. This Not Applicable category is used very rarely in most rating situations and was not included in the overall assessment of the product (item 9), which uses a 1–4 Likert-type scale.

To examine content validity further, the form was evaluated by several recognized national authorities in the field of education of the gifted and in educational research. It was also distributed to 20 experienced teachers of the gifted in Connecticut. The authorities were asked carefully to assess the content of the form for omissions, clarity, and duplications. They were also asked for suggestions which would improve the form. Very few suggestions or omissions were mentioned by the experts, and the form was modified only slightly.

Reliability

Interrater Agreement. Interrater agreement was determined in two separate phases. In the first phase, 19 raters familiar with the field of education of the gifted (many of the raters were resource room teachers of the gifted) rated an original book on skunks, the product of a first grader. No explanations of the scale or the instructions were given; raters were simply given a copy of the SPAF and the product. They were also asked to assess the SPAF for language clarity, duplication, ease of instructions, and omissions (a further check on content validity). In other words, rater training was accomplished through the three pages of instructions which accompany the form. This was considered to be important for future use of the instrument, which is intended to be independent of formal in-service training.

After the phase one field test, the *Student Product Assessment Form* was revised according to interrater agreement percentages. Items 2, 6, and 7, which did not receive an agreement percentage of 80%, were revised and refined; one key concept in item 9 was eliminated and replaced with an item that three raters had listed as an omission. In the phase two field test, 22 raters (19 of the phase one group and 3 additional teachers of the gifted) rated a second product (an original local historical walking tour of a Connecticut city) and a third product (a novel written by a sixth grade student). On the second product, interrater agreement of 100% was achieved for 12 of the 15 items. The other 3 items achieved agreement percentages of 86.4, 90.9, and 95.5. The nature of the third product (the novel) made it more difficult to attain interrater agreement above 80% in two areas, level of resources and diversity of resources. However, all other agreement percentages were above 80%, and 90% agreement was achieved for 10 of the 15 items.

Stability

An additional consideration addressed was the extent to which the ratings would be stable over time. Stability reliability was determined by having the same raters assess product two (the historic walking tour) approximately 2 weeks after the first assessment. Almost identical responses and percentages were recorded. A correlation of + .96 was achieved between the first and second assessment of product two.

Interrater Reliability

A final phase of the reliability check was the generation of interrater reliabilities for 20 different products listed in Table 1. The products represented five different product types including Scientific (n = 7), Creative Writing (n = 5), Social Studies (n = 5), Audio-Visual (n = 2) and Interdisciplinary (n = 1). The products were submitted for assessment to staff members in three public school programs for gifted students in Connecticut. Four experienced teachers of the

gifted were asked to evaluate the products using the *Student Product Assessment Form*. The products varied in format, subject matter, age of the student who completed them, and final form. Some products were accompanied by a completed management plan (a contract-like form used in some programs for the gifted). Other products were accompanied by the completed student guide that is an optional segment of the *Student Product Assessment Form*.

In some instances, the raters interviewed the student who had completed the product before evaluating it. Other times, the raters evaluated the final product simply by examining it without interviewing the student. This was considered essential for the generalizability of the instrument since it will be used in all of these situations.

Table 1
Listing of Products by Type Used to Generate Interrater Reliability

Type[a]	
4	1. A weekly television show, "All Kinds of Kids" which is directed, produced, and filmed by a group of gifted students.
1	2. A filmstrip on topology.
2	3. A short story.
1	4. A nonfictional book on pond life in Connecticut.
1	5. A book on skunks.
3	6. A genealogical investigation of a family and resulting book.
1	7. A scientific investigation of mapping pond life resulting in a photo essay and book.
3	8. An historical investigation and recreation of the "Battle of the Bulge."
1	9. A model solar home.
1	10. A reflector telescope.
5	11. A filmstrip on computers and their history.
3	12. A study on the attitudes of school and community toward the E.R.A.
3	13. An historical walking tour of a city.
2	14. A short novel.
2	15. An autobiographical creative writing report.
3	16. An investigative study of a political issue in a community.
2	17. A book of poetry.
2	18. A novel titled *Slave Boy*.
1	19. A solar collector.
4	20. A documentary film on sign language.

[a] Scale for Types of Products
1 - Scientific
2 - Creative Writing
3 - Social Studies
4 - Audio-visual
5 - Interdisciplinary

To obtain the interrater reliabilities, the technique described by Ebel (1951) was utilized which intercorrelates the ratings obtained from different raters (see Guilford, 1954, pp. 395–397). The ratings of the four separate raters were correlated for each item presented in the SPAF as well as on the subtotals of Items 1 through 8, Items 9 A-G, and on the total rating of the items. Since each of the raters rated 20 products on 15 different traits, intercorrelations of the ratings of the products from all possible pairs of ratings were obtained. Table 2 presents the interrater reliability results of the mean reliability for one rater as well as four raters, on the nine different items. Also included are the subtotals and total rating of the *Student Product Assessment Form*.

It should be noted that two key concepts, Audience and Original Contribution, had lower reliability when evaluated by one rather than when evaluated by four raters. Since SPAF will often be used by single raters in the future, those two areas will need further examination.

Table 2
Student Product Assessment Form

Interrater Reliability of One Rater and Four Raters on Individual Items and Totals[a]

Items	1 Rater	4 Raters
1. Early Statement of Purpose	1.000	1.000
2. Problem Focusing	1.000	1.000
3. Level of Resources	.973	.993
4. Diversity of Resources	.963	.990
5. Appropriateness of Resources	.983	.996
6. Logic, Sequence, and Transition	.779	.934
7. Action Orientation	.913	.977
8. Audience	.533	.820
Subtotal Key Concepts 1 - 8	.994	.998
9. Overall Assessment		
A. Originality of the Idea	.778	.993
B. Achieved Objectives Stated in Plan	.789	.937
C. Advanced Familiarity with Subject	1.000	1.000
D. Quality Beyond Age/Grade Level	.912	.971
E. Care, Attention to Detail, etc.	1.000	1.000
F. Time, Effort, Energy	.875	.966
G. Original Contribution	.390	.718
Subtotal Key Concepts 9A - G	.924	.980
Total of All Items on SPAF	.961	.990

[a] Note that these data are based upon 20 products rated by four people.

The higher interrater reliability should be examined with the realization that the products submitted for evaluation were from three outstanding programs for gifted and talented students. The teachers who submitted products often chose them for their high quality. It could be that less superior products will be associated with lower reliabilities. Future data will be collected in this area. In summary, this section has described the development of the *Student Product Assessment Form*. Content validity procedures were presented and reliability assessment procedures (interrater agreement, stability, and interrater reliability) were described.

Uses of the Student Product Assessment Form

An almost universal characteristic of students of all ages is a desire to know how they will be evaluated or "graded." We would like to begin by saying that we strongly discourage the formal grading of students' creative products. No letter grade, number, or percent can accurately reflect the comprehensive types of knowledge, creativity, and task commitment that are developed within the context of a creative product. At the same time, however, evaluation and feed-back are an important part of the overall process of promoting growth through this type of enrichment experience, and students should be thoroughly oriented in the procedures that will be used to evaluate their work.

The best way to help students understand the ways in which their work will be evaluated is to conduct a series of orientation sessions organized around SPAF. Two or three examples of completed student products that highlight varying levels of quality on the respective scales from the SPAF instrument will help students to gain an appreciation for both the factors involved in the assessment and the examples of the manifestation of each factor.

The evaluation of student products in many gifted programs has been carried out in a random and rather haphazard manner. Often, no evaluation occurs and a valuable opportunity to provide feedback and to discuss future ideas for subsequent work is lost. If SPAF is used to evaluate completed student products, the cover sheet (see Figure 1) could be filed in students' permanent record folders, providing an academic portfolio of their creative products from the primary grades through high school. Since so many gifted programming models include the development of student products (Betts, 1986; Clifford, Runions, & Smyth, 1986; Feldhusen & Kolloff, 1986; Feldhusen & Robinson, 1986; Kaplan, 1986; Renzulli & Reis, 1985), the evaluation of such products would seem not only logical, but advisable.

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