

## **Effect of Academic Interventions on the Developmental Skills of Slow Learners**

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The present study was a single-group pre-test and post-test design; it was conducted to see the effectiveness of academic interventions (Shaw, 2005) on developmental skills (adaptive, personal-social, communication, motor, and cognitive) of slow learners having borderline intelligence. Eight slow learners were identified through subjective ratings based on teacher's appraisal and attained achievement scores in respective grades and scores attained on Raven's Colored Progressive Matrices (CPM; Raven, Court, & Raven, 1977) during screening. Boys ( $n = 6$ ) and girls ( $n = 2$ ) of ages ranging from six years to six years and 11 months of age were purposefully selected from two private-sector schools of District and Tehsil Sargodha, Punjab, Pakistan. Developmental skills of slow learners were measured by Battelle Developmental Inventory (BDI-2; Newborg, 2004); assessment and screening was followed by academic intervention. Quantitative analyses revealed that academic interventions were highly effective in enhancing the developmental skills of slow learners' adaptive, communication, and cognitive developmental skills. However, these interventions remained silent and failed to show any positive effect on personal-social and motor skills.

**Keywords:** Slow learners, academic interventions, developmental skills

The challenge of identifying slow learners has been a topic of increasing concern of researchers from last few decades (Khan, 2005; Shaw, 2003; Sing, 2004). Academically slow learners are usually identified based on their attained scores on intelligence tests, with IQs

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between 75-89. A slow learner differs slightly from normal children in learning ability and cannot meet average academic standards year to year. Their intelligence test scores are likely to be low from average test scores. However, not too low to meet the large discrepancy set as an inclusion criterion for special educational services (Mercer, 1996). Although slow learner may have special educational needs, yet they do not fit neatly into the special education system and generally study at normal schools (MacMillan, Gresham, Bocian, & Lambros, 1998). Academic slow learners are also labeled as borderline mentally retarded, dull, below average children. They are generally slow learner when they are faced with tasks requiring abstract, symbolic, and conceptual skills (Lowenstein, 2003).

Furthermore, rate of slow learning direct these children (slow learners) to lag behind in their normal developmental skills acquisition and they tend to grasp basic concepts of living (i.e., social interaction, communication styles, memory skills, and thinking patterns) about 1-2 years later in comparison to peers (Carroll, 2002; Gouwens, 2002; Kaznowski, 2004). Borderline intellectual functioning contributes negatively in their life as they lack concentration, have poor memory, imagination, and foresight; an inability to express ideas clearly through the medium of language (Bhatt, 2009).

Research indicates that academically slow learners pose significant educational and behavioral difficulties in the schools because of their deficiencies in intellect and psychosocial skills (Anastasia, Elein, & Effi, 2006; Shaw, 2008). They differ from average students in the rate of learning and need much external stimulation/encouragement to do the simple of work (Krishnakumar, Geeta, & Palat, 2006; Stenhouse, 2005). This is also well documented that slow learners do work at their ability level but below their grade level, which in turn leads to their adjustment problems in mainstream class rooms (Krishnakumar et al., 2006). Their deficit in skills (e.g. inadequate coping mechanisms, poor self-image, immature interpersonal relationships, troubled communications, and inappropriate social role ideology) make them vulnerable or at risk of several psychosocial problems. These problems could only be addressed by incorporating interventional teaching strategies in the inclusive classrooms for their accommodation and to enhance the rate of their adequate psychosocial development i.e., better adult and peer interactions, enhanced receptive and expressive communication, and modesty of self-concept, and social role by expressing logical reasoning and understanding of environmental demands (Anastasia et al., 2006).

In the context of Pakistani academic setting, unfortunately there is sparse empirical evidence which may assist academic settings (schools) to identify slow learners (Aly, Taj, & Ibrahim, 2009), with the help of standardized and objective measures (IQ tests scores) (Hussein, 2009) and to develop and implement special educational criteria and curriculum and provide interventions for associated mental health issues (Haider, 2008).

Majority of these children, are initially not identified as slow learners requiring special education and specifically designed interventions (Shaw, 2008). This is probably because of the fact that they are able to understand things up to some level and donot present serious problems in their functional skills; these children function normally and they have physical agility and adeptness in different situations. Moreover, they also demonstrate common sense and appear to have adequate memory (Mroczka, 2003). However, the typical problems in general cognitive function are more evident, when they are required to perform a task requiring higher mental processes; they fail to accomplish the task, mainly due to deficits in abstract thinking, organizational skills, and generalization of information, which creates hurdles in their academic success (Balado, 2003).

To ensure slow learners' success in schools, their rate of slower learning needs to be accommodated through specifically designed interventions in accordance with their ability level (Shaw, 2008). Before going toward the intervention, it is critical that teachers and parents should consider assessment through a number of sources before assuming that poor school performance is due to a slower learning ability (Carroll, 2002).

Hussein's (2009) study supported the notion that; child's mental health is largely influenced by child's home environment, child's schooling, and the society at large. This confirms the critical and helpful role of parents and teachers in giving prime attention, vigilance, and care to ensure sound mental health (Aly et al., 2009; Haider, 2008; Rahman, Mubbashar, Harrington, & Gater, 2000; Rehman, 2005; Yaqoob, Ferngren, Jalil, Nazir, & Karlberg, 2008). Developmental psychologists have affirmed the importance and relation of IQ with developmental skills acquisition. A firm view is that there is strong interplay between environmental factors and person's normal functioning which determine his/her successful social life. Erickson (1950) has given importance to cultural and social aspects of life and describes the impact of social experience across the whole lifespan. According to him one's life is a series of lessons and challenges which help us to grow in multiple stages of life. Further, Vygotsky (1978) contributes that if theses leaning aids are give in a manner that they

relate with the cultural context of the child then profound impact on the developmental skills becomes more visible.

It is evident from literature that while dealing with children with borderline intelligence, theories of Erickson and Vygotsky are valuable (Tudge, 1990; Wood, 1998). Based on Erickson and Vygotsky's theories, various models of slow learners and their related risks have emerged and Shaw's model of slow learners and mental health issues is the one most widely used. Shaw (2000a) described the slow learner's borderline intellectual functioning in relation to their developmental tasks. It also elaborates how deficiencies in these task completions can lead to various kinds of mental health risks among slow learners.

Keeping in view, the specified significance of research on slow learners in Western community and effectiveness of Shaw's academic intervention plan, the dire need was felt to explore application of academic interventions based on Shaw's model in Pakistani settings. The present research is designed to find out the effectiveness of academic interventional teaching plan for developmental skills of slow learners. On the basis of the objective of this study, following hypothesis was formulated for the study:

*Hypothesis 1:* Slow learners will show higher level of adaptive skills in post-test assessment in comparison to pre-test assessment.

*Hypothesis 2:* Slow learners will show higher level of personal-social skills in post-test assessment in comparison to pre-test assessment.

*Hypothesis 3:* Slow learners will show higher level of communication skills in post-test assessment in comparison to pre-test assessment.

*Hypothesis 4:* Slow learners will show higher level of motor skills in post-test assessment as compared to pre-test assessment.

*Hypothesis 5:* Slow learners will show higher level of cognitive skills in post-test assessment as compared to pre-test assessment.

## **Method**

### **Sample**

Slow learners ( $N = 08$ ), both boys ( $n = 6$ ) and girls ( $n = 2$ ), were purposefully selected from two private sector schools of urban area of District and Tehsil Sargodha, Punjab, Pakistan. In order to have a

homogeneous control sample for comparison, the children were matched for age (6 year to 6 years & 11 months of age), grade (1<sup>st</sup> grade), high socioeconomic status (above Rs. 31, 000/- per month), and mother tongue as Urdu. Eight participants were identified as slow learners on the basis of Raven's Colored Progressive Matrices (CPM; Raven et al., 1977) scores i.e., scoring between 10<sup>th</sup> to below 25<sup>th</sup> percentile and teacher's appraisal; teacher appraisals based on the consideration of the child performance in curricular and recreational interests and overall academic performance in the class, designated as dull or below average in comparison to class mates.

### **Instruments**

**Colored Progressive Matrices (CPM).** It is an internationally recognized culture-fair, nonverbal IQ test, to measure the 'g' factor. It is specially designed for use with children between ages of 5 ½ and 11 ½ years. This easily administered, paper and pencil test is comprises of three sets of twelve problems, arranged to "assess mental development up to a stage where a person is sufficiently able to reason by analogy to adopt this way of thinking as a consistent methods of inference" (Raven et al.). In the present study children having the raw scores and corresponding percentiles between 10<sup>th</sup> to below 25<sup>th</sup> percentile were identified as slow learners. Literature supports that (Gatti, 2004; Li, Gamlin, Jain, & Luther, 2001; Pujar & Gaonkar, 2008) Raven's CPM is a reliable source to identify slow learners/intellectually subnormal or have deteriorated cognitive abilities.

**Battelle Developmental Inventory-2.** Slow learners were assessed for their key developmental skills through the second edition of Battelle Developmental Inventory (BDI-2; Newborg, 2005). The full BDI-2 battery consists of 450 test items grouped into the following five domains (i) adaptive domain i.e., child's ability to use the information and skills acquired in the other domains, (ii) personal-social domain i.e., abilities and characteristics that allow a child to engage in meaningful social interaction with adults and peers and to develop his or her own self-concept and sense of social role, (iii) communication domain i.e., how effectively a child receives and expresses information and ideas through verbal and nonverbal means, (iv) motor domain i.e., the child's ability to control and use the large and small body muscles, and (v) cognitive domain i.e., those skills and abilities most commonly thought as mental or intellectual, with the

exception of language and communication skills. BDI-2 has been successfully used by medical and health professionals for the assessment of psychomotor developmental delays (HOPE, 2009a, 2009b), assessment of disabilities, and assessment of typical developmental rate of children in Pakistan (Aly et al., 2009).

**Academic interventional teaching plan.** It is essential for educational sector to accommodate every child in productive environment and it is desired to have best method of teaching and training of slow learners/at risk students to be incorporated with the traditional ones to enforce the learned material. For this purpose in the light of four broader themes given by Shaw (2000b), an academic interventional teaching plan was designed and implemented in mainstream classrooms. The following steps were undertaken to implement the academic interventional teaching plan:

1. *Modification in the curriculum and study material:* The standard curriculum of Punjab Text Book Board, Punjab, Pakistan of first grade was modified as more pictures books, charts, models, and educational blocks (made of thermopile, plaster of paris and wood), educational software of games (e.g., rays package of learning aid, old mac-dot farm etc.), and puzzles (letter and picture matching exercises in math, english, and urdu; count and tell, tell before and after, hundreds, tens, and ones, find the largest number, find the same or spot the different one) with the help of computers, educational rhymes, short stories, crayons, poster colors, and playful dough (clay) along with paper and pencil, were made part of study. This was accomplished with the help of art teacher and a professional artist.
2. *Modification in classroom environment:* A regular seat change plan was designed to be implementing on weekly basis. Slow learners were stipulated to be sitting in front whereas their peers had a weekly seat change program by rotation. Walls were decorated and painted with teaching material models, charts, pictures, and story characters. This was furnished with the help of an artist and art teacher, who were assisted by the researcher and class teachers for generating ideas.
3. *Modification in time demands:* The deadlines for task completion/performance were designed to be lenient for slow learners as compare to other class fellows i.e., if normal average child needed 5 minutes for one problem solution then 7-8 minutes were given to slow learners.

4. *Peer tutoring and use of groups in learning:* Class assignments were gradually made easy for slow learners and were given in small parts/units. In this activity, slow learners from advanced classes were asked to ‘tutor’ the younger grade students. In addition, complex and technical educational tasks related to subject area were distributed among groups.
5. *Daily good behavior exercise:* In daily routine a ‘model good behavior’ was exercised through peer role play, which was monitored (through observation by researcher and teacher) and was incorporated (imitated) in their routine behavior as a mode of social-skills training and social problem solving exercises. For example “how to take permission”, “how to say good morning and good bye”, “how to say sorry on your mistakes by accepting them”, “how to pay gratitude by saying thank you”, etc. These exercises aimed at helping slow learners in resolving problems related to interpersonal communication, problematic relations, and poor initiative-taking and motivation issues.
6. *Differential reinforcement and immediate feedback to reward (every) desirable behavior:* On each successful task accomplishment and initiative, immediate feedback (in form of praise from teacher and clapping from the peers was initiated) and encouragement were made part of intervention plan; to help boost their self-esteem and self-confidence.
7. *Review of concepts on weekly basis:* At the last working day of week (on Friday’s), the week plan was reviewed in a light/fun way with the help of various techniques such as drama, role-play, storytelling, and presentations. This exercise aimed at assisting children to develop associations between concepts with help of pictorial presentation of each concept and models of learning material.

## Procedure

Written informed consent from the schools, teachers and parent of slow learners was obtained before the start of this intervention program. At first step after sample selection of eight slow learners, baseline measurement (pre-test) of developmental skills was carried out and slow learners were assessed through BDI-2 for their developmental skills prior to interventions.

Only those two schools were selected whose principals allowed imparting interventions, agreed to spend finances on teaching aids,

and their teachers expressed commitment for the intervention. Both the schools run from play group to grade 10, and follow the standard curriculum of Punjab Text Book Board, Lahore, Pakistan for the year 2008. They had 30 teachers as a total teaching staff whose education ranges from Bachelors of Arts (BA) to Masters of Science (MSc). The selected teachers ( $n = 4$ ) for interventions had the education level of BA or Bachelors of Education and were acknowledged by their school administration for having good communication skills and tactfulness in dealing with challenging situations. Prior to intervention they received a six-day training program that was inspired by teaching aid manuals of UNESCO (2007) and UNICEF (2007), and Shaw's guide of educational programming framework (2005, 2008, & 2010) and teaching resources for teaching slow learners (Shaw, 2001). Teachers' training was carried out to ensure the proper implementation of intervention plan. Parents of all eight slow learners were also involved; regular parents, teacher, and researcher meetings were arranged.

At second step, participants were exposed to academic interventional teaching plan for a period of four months for five days/week and four hours/day in a mainstream room setup, which was inclusive of different abilities level. At third step, after the completion of the intervention period, second baseline measurement (post-test) of developmental skills of slow learners was taken through BDI-2. To assess the difference between two baseline measurements as an effect of academic interventions Wilcoxon Signed Rank test was applied on data.

## **Results and Discussion**

Different instructional strategies used in the academic interventional teaching plan for slow learners were found to be effective in terms of enhancing the developmental skills level of slow learners in inclusive classrooms. The findings indicate an expected increase in the range of scores on BDI-2 in post-test, compared to the pre-test scores. Hence, these findings support study assumption that slow learners will score higher on BDI-2 after having exposure to academic interventions.

Table 1 shows enhanced scores of the slow learners on all developmental skills. There appears to be a shift in the ranges of scores on all indices of development. Similar trends were observed in the median effect size and Wilcoxon Signed Ranks values of pre-test and post-test of slow learners on BDI-2, its domain and sub-domains.

Table 1

*Means, Standard Deviations, Minimum, and Maximum Range of Scores on Battelle Development Inventory (N = 8)*

| Developmental Skills <sup>a</sup> | Pre-test |     | Post-test |     |
|-----------------------------------|----------|-----|-----------|-----|
|                                   | Min      | Max | Min       | Max |
| Adaptive (ADP)                    | 80       | 85  | 98        | 98  |
| Self-care                         | 56       | 59  | 62        | 62  |
| Personal responsibility           | 24       | 26  | 36        | 36  |
| Personal-Social (P-S)             | 136      | 149 | 147       | 156 |
| Adult interaction                 | 50       | 52  | 51        | 51  |
| Peer Interaction                  | 30       | 33  | 35        | 37  |
| Self-concept and social role      | 56       | 64  | 61        | 68  |
| Communication (COM)               | 110      | 113 | 127       | 139 |
| Receptive communication           | 51       | 52  | 56        | 67  |
| Expressive communication          | 58       | 62  | 71        | 72  |
| Motor (MOT)                       | 152      | 162 | 160       | 168 |
| Gross motor                       | 77       | 80  | 78        | 79  |
| Fine motor                        | 49       | 53  | 50        | 53  |
| Perceptual motor                  | 26       | 29  | 32        | 36  |
| Cognitive (COG)                   | 128      | 134 | 154       | 164 |
| Attention and memory              | 48       | 50  | 52        | 52  |
| Reasoning and academic skills     | 32       | 33  | 42        | 50  |
| Perception and concepts           | 48       | 51  | 60        | 62  |
| Total                             | 607      | 641 | 686       | 725 |

*Note.* The scores depicted in the table are scored by slow learners; the ages ranged from six years to six years and 11 months. The term 'total' refers to composite scores, calculated by adding up scores on each domain of Battelle Development Inventory (Newborg, 2005).

<sup>a</sup> the study measures five developmental skills. The major categories have their abbreviations in parentheses.

The findings in Table 2 reveal significant differences between the pre-test and post-test scores of slow learners after the exposition of academic interventions especially in the domains of adaptive, socio-personal, communication, and cognitive which confirms the study hypotheses no. 1, 2, 3, and 5.

Table 2  
*Median, Effect Size, and Wilcoxon Signed Ranks Values of Pre-test Post-test Assessment of Slow Learners on Developmental Skills (N=8)*

| Developmental Skills <sup>a</sup> | Pre-test   | Posttest   | z     | r    | p   |
|-----------------------------------|------------|------------|-------|------|-----|
|                                   | <i>Mdn</i> | <i>Mdn</i> |       |      |     |
| Adaptive (ADP)                    | 83         | 98         | -2.46 | -.63 | .01 |
| Self-care                         | 59         | 62         | -2.64 | -.65 | .01 |
| Personal responsibility           | 25         | 36         | -2.6  | -.64 | .01 |
| Personal-Social (P-S)             | 146        | 148        | -1.10 | -.4  | .19 |
| Adult interaction                 | 52         | 51         | -1.41 | -.31 | .48 |
| Peer interaction                  | 31         | 37         | -2.55 | -.63 | .01 |
| Self-concept and social role      | 62         | 62         | -.42  | -.14 | .37 |
| Communication (COM)               | 111        | 137        | -2.55 | -.63 | .01 |
| Receptive communication           | 52         | 66         | -2.57 | -.63 | .01 |
| Expressive communication          | 59         | 71         | -2.57 | -.63 | .01 |
| Motor (MOT)                       | 161        | 161        | -.44  | -.15 | .39 |
| Gross motor                       | 80         | 78         | -1.41 | -.3  | .14 |
| Fine motor                        | 53         | 50         | -.90  | -.06 | .28 |
| Perceptual motor                  | 28         | 33         | -2.64 | -.65 | .01 |
| Cognitive (COG)                   | 131        | 158        | -2.55 | -.63 | .01 |
| Attention and memory              | 49         | 52         | -2.57 | -.64 | .01 |
| Reasoning and academic skills     | 32         | 44         | -2.55 | -.63 | .01 |
| Perception and concepts           | 49         | 61         | -2.55 | -.63 | .01 |
| Total                             | 629        | 703        | -2.55 | -.63 | .01 |

*Note.* The scores depicted in the table are scored by slow learners; the ages ranged from six years to six years and 11 months. The term ‘total’ refers to composite scores, calculated by adding up scores on each domain of Battelle Development Inventory (Newborg, 2005).

<sup>a</sup> the study measures five developmental skills. The major categories have their abbreviations in parentheses.

This further indicate that adaptive skills (self-care and personal responsibility), personal-social skills (peer interaction), communication skills (receptive and expressive communication), motor skills

(perceptual motor), and cognitive skills (attention and memory, reasoning and academic skills, and perception and concepts skills) were significantly enhanced as a result of profound effect of academic interventions.

However, adult interaction, self-concept, and social role (personal-social skills), gross and fine motor skills (motor skills) failed to get any benefit from the interventions. This partially confirms the study hypotheses that slow learners get benefit in their domains of personal-social, communication, and cognitive skills. However, peer interaction shows profound and significant effect of interventions with exception to total domain of personal-social, adult interaction, and self-concept and social role.

Furthermore similar findings were obtained through the daily feedback of teachers (they were instructed prior to the interventions implementation that they would prepare feed back by checking each and every behavior) and researcher's observations.

These interventions were new for the participants to the study; they seem to appear more confident and displayed positive sense of self-worth and feeling of belongingness which help them integrating well in their class and peers. Also it was observed that exposure to concrete instructions and immediate feedback on goal-directed behaviors, helped these students in following instructions and establishing the efficacy to complete daily tasks with minimal prompting.

Peer tutoring (Behera, 2009; Clattenburg, 2003; Hussein, 2009) and social skills exercises helped them learn the skill of asking, taking permission, paying gratitude, and coping with challenges. Moreover, receptive and expressive communications skills seemed to have benefited from the multilevel interventions and they were observed displaying empathy towards others i.e., understanding feelings, thoughts, and emotions of others; recognizing facial expressions and maintaining appropriate eye contact while communicating with others.

Moreover, these interventions helped to build their sense of safety by understanding the model behavior to safeguard them from danger; they appear more aware about morality and took pride in their self-accomplishments.

This is fair to say that the participants seem to have maximum benefit of this intervention i.e., review of concepts on a weekly basis helped boosting up their minor level leads by maximum course of revisions. These reviews were in the form of educational rhymes, stories, play, drama and fun activities set them free from the burdens of educational life. They in fact learned significantly, by the use of

casual teaching styles and non-formal remediation teaching strategies; rather than learning in more structured classroom setup.

The researcher was aware of their limited cognitive abilities, and giving them large amount of information in paper-pencil form in one setting was very difficult (Haskvitz, 2007). However, this teaching was incorporated and internalized through creative activities to meet their unique needs for attaining achievement and success (Shaw, Grimes, & Bulman, 2005).

As expected these academic interventions and modified curriculum with a blend of charts, pictures, and models provided opportunities for effective integration, adjustment, and better learning opportunities (Pujar & Gaonkar, 2008). These made participants more alert, prompt, and active; they were highly motivated and interested in learning. This helped improving their speed of learning and provided them with knowledge and a strong base for understanding and conceptualization. Several previous studies (Mohansundaram & Dharmashekar, 2001; Philip & Marcia, 2002; Reddy & Ramar, 1995; Singh, 2004) have also revealed that interventions through different stimulating and enriching instructional strategies and multimodel approaches are certainly effective than the traditional method of teaching for slow learners in mainstream classrooms.

Similar feedback was received by the parents in parent-teacher and parent-researcher meetings that these children showed remarkable progress in interpersonal and social skills. These results were also in line with the findings of Davis and Williams (1972) that slow learners got maximum advantage by multi-model approach instead of uni-model approach i.e., if they are taught by using different strategies then it particularly help them in creating a favorable attitude toward learning and promote a sound conceptual understanding of the taught material.

These findings also confirm the Vygotsky's (1978) concept of practical intelligence in one's own cultural context i.e., proximal zones. Thus etiology of learning is social interaction. A concept is first presented to a child socially (inter psychologically) either by parent, peer, or teacher which is later internalized by the child; who then appears to employ it for problem solving. According to this concept if the cultural context/proximal zones of the slow learners whether in educational paradigms or in home setting is more facilitating in nature then the chances of their practical intelligence can be raised. It can be done with the help of intervention as and if early identification and special needs advocacy is going to be taken into account then one can safe guard slow learners for indulging in several mental health issues and their adjustment in the society can be enhanced.

Present research supported that slow learners were enrolled in mainstream schools; due to deficit in developmental skills they needed extra attention of teacher, policy makers, and psychologists. They were also found to be at risk of several mental health problems because of their below average intellectual abilities and deficit developmental skills. However, an early identification, assessment of developmental skills, and supportive interventional plan can safeguard this large minority from various adversities of school and social life; yet this a neglected area of Pakistani education reforms so far. These interventions boosted the rate of developmental skills and worked as an enhancer in this way, which proved that interventional teaching plan works is very much effective in enhancing the developmental skills of slow learners studying in mainstream classroom. In addition, it not only improved their mental health but also increased the levels of adjustment in the mainstream classroom and helped them become part of progressive community. This gives an implication for the need of interventional training of academic nature for slow learners that can assist them to advance so that they can parallel children without learning problems.

### **Conclusion and Implications**

The findings of the study confirmed that the academic interventions were very effective in enhancing the developmental skills of slow learners. It was also found that slow learners got maximum benefit of academic interventions for their sociocultural settings. Majority of students benefited from academic intervention applied in a creative manner i.e., with the help of drama, role play, rhymes, and storytelling. It was also felt that review of concepts on the last working day was found to be of greatest help to students. Present study also had practical and theoretical implications; it not only adds up to the theoretical constructs of educational and school psychology but also for the persons of academia, policy makers, educational, and child psychologist and counselors in special needs advocacy.

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