

Effective teaching to reduce educational failure

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This paper provides background information on key features of effective teaching. The information is drawn partly from what is termed 'process-product research'. In this type of research teachers' actions and reactions when teaching typical lessons have been observed, recorded and later analysed. The results are then correlated with students' measured achievement in the school subject taught in the lessons. The teachers' actions represent the 'process' of instruction; the students' test scores represent the 'product' of learning. Process-product research focuses on what teachers actually do that makes a difference in what students learn (Freiberg & Driscoll, 2000; Kauchak & Eggen, 1998).

Other information on effective teaching comes from large-scale studies such as TIMSS (*Third International Mathematics and Science Study 1995/1999*) where teachers' instructional styles and skills have been considered in relation to students' achievement levels (Mullis et al., 2000).

The paper also provides evidence concerning school students' own perceptions of what makes a 'good' teacher, together with discussion of the most recent thinking on what makes some teachers effective and some teachers less effective (e.g. Davis, 2001; Jacobsen, Eggen & Kauchak, 2002; Reynolds, 2000).

Does the quality of instruction make a difference to students' learning?

Many years ago, in a book titled *Why teachers fail*, Lembo (1971, p.7) wrote:

While there are many complex factors, physical, psychological, economic and sociological, which account for each child's school performance, the basic cause of failure is the schooling process itself. Students do not enter school as failures. When students 'fail' it is the practices which teachers and administrators individually and collectively employ that are at fault (and) unless the classroom teacher's policies and practices are viewed as the most significant conditions in determining the direction and quality of classroom learning, and unless attempts at improving classroom learning focus on the formulation of more effective teaching policies and practices, there will be no significant reduction in the number of students who year after year become alienated from the educational process.

These remarks remain as true today as they were in 1971. If Lembo is correct, the key to reducing learning failure in schools lies in using more effective teaching methods.

What has research said about effective teaching?

It can be firmly concluded from research that teachers' skills in the classroom are positively related to students' achievement (e.g. Brophy & Good, 1986; Galton et al., 1999; Hirsch, 2000). It has been noted that teachers who help their students learn successfully tend to exhibit a particular set of characteristics in their general approach. Studies have indicated that although expert teachers differ in their actual *style* of teaching and management, they all use strategies that (i) maximize students' time and engagement in learning tasks and (ii) encourage students' active participation during lessons. In addition, (iii) they ensure that students understand the work they are required to do and (iv) they set tasks and activities at the right level to ensure high rates of success. Expert teachers also (v) create a positive and supportive classroom environment, (vi) are good managers of behaviour, and (vii) are skilled in *motivating* students to learn.

The process-product research suggests that there is indeed a set of general characteristics of effective teachers, and these characteristics are evident regardless of the school subjects they are teaching (Good & Brophy, 2003). These same characteristics tend to be confirmed by school students' own perceptions of 'good' teachers (e.g. Batten, Marland & Khamis, 1993; Morgan & Morris, 1999).

Teaching for higher achievement

Let us look briefly at the domain of school mathematics as one example. Studies have shown that particular ways of teaching mathematics appear to produce higher achievement levels (and lower failure rates) than do other methods (e.g. Bishop, 1999; Mullis et al., 1997; Mullis et al., 2000; Reynolds & Farrell, 1996). International studies have tended to find that the way mathematics is taught in schools varies somewhat from country to country; and the different methods then produce different learning outcomes. Japan, China and other Pacific Rim countries, for example, usually produce some of the highest achievement levels in mathematics when compared with countries such as USA and Britain (Mullis et al., 2000; Schaub & Baker, 1994). While there are certainly significant cultural factors that may influence student achievement and motivation in these countries, the teaching methods used are also fairly different. In particular, teachers in Japan, China, Taiwan and Korea tend to use much higher quantities of *whole-class interactive instruction*, rather than unstructured group work, discovery learning and individualised programming. This direct (*but interactive*) teaching method appears to be very effective in ensuring that skills and concepts are thoroughly practised, applied, and understood by all students. It is remarked that under this system, the gap between the high achievers and the low achievers is not so obvious, and does not widen significantly over time as it does in some countries (Schaub & Baker, 1994; Reynolds & Farrell, 1996).

Critics often suggest that teaching methods in these high-achieving countries produce students who are good at basic arithmetic as a result of rote learning but are weak at problem solving and application. The evidence does not support this view. For example, video studies of classrooms in Japan have shown that teachers there spend large amounts of time in getting students to analyze problems and think critically and reflectively about the mathematical concepts and processes they need to apply (Stigler & Hiebert, 1997). They also follow this up with direct explanations and summaries of what students have learned. Schaub and Baker (1994, p.164) have concluded, 'Effective mathematics teaching is not culturally bound. Effective teaching and learning is attainable using sound, proven, and standard methods of classroom management and instruction'.

In Britain, where the results of international surveys caused concern in the early 1990s about children's achievement levels in mathematics, the Office for Standards in Education (OFSTED) carried out its own study. In 1993 OFSTED reported the results from a direct observation of teaching and learning in 384 mathematics lessons across 128 primary schools. In the least successful classrooms much of the teaching time appeared to be taken up in organisational and management matters relating to group work or individualised programming. Higher standards were most evident in classes where the approach was mainly *direct interactive teaching* involving teacher demonstrations, explanations, questioning, and discussion. The approach was not 'transmission' teaching (although some information was certainly directly taught) but rather it was characterised more by the questioning strategies used to challenge students as a group to think and reason in greater depth about the number concepts and processes they were using.

The OFSTED study (1993, p.7) lists the following characteristics of the teaching in classes producing the best learning outcomes in mathematics:

- well planned work which established clear lines of progression based upon a sound assessment of the pupils' ability
- an appropriate balance of whole-class, group, and individual work
- teaching which enabled the children to talk confidently about number, to ask and to respond to relevant questions, and to receive clear explanations about number operations and relationships
- a brisk pace achieved through setting and monitoring clearly defined tasks
- mental work, including the learning of tables and number facts and involving, where appropriate, the application of number to real life problems

- purposeful investigation which strengthened the pupils' understanding of number patterns and relationships, often through work in other subjects such as science or technology
- consistent and constructive marking of work, including a clear analysis of errors and what needed to be done to correct them
- well-organised classrooms in which the teacher and the pupils made effective use of a range of printed and practical materials and achieved a good mix of mental, oral, practical and written number activities.

Effective teaching: general principles

Let us move beyond the teaching of mathematics to the teaching of other basic academic subjects. The research on effective teaching in general suggests that very effective teachers exhibit the following characteristics (Jacobsen, Eggen & Kauchak, 2002; Kauchak & Eggen, 1998; Killen, 1998; McBer, 2000).

Effective teachers tend to:

- have well-managed classrooms
- provide students with the maximum opportunity to learn
- maintain an academic focus
- have high, rather than low, expectations of what students can achieve
- are business-like and work-oriented
- show enthusiasm
- use strategies to keep students on task, motivated, and productive
- impose structure on the content to be covered
- present new material in a step-by-step manner
- employ direct (explicit) teaching procedures
- use clear instructions and explanations
- use a variety of teaching styles and resources
- frequently demonstrate appropriate task-approach strategies
- monitor closely what students are doing
- adjust instruction to individual needs, and re-teach where necessary
- provide frequent feedback to students
- use high rates of questioning to involve students and to check for understanding
- spend significant amounts of time in interactive whole-class teaching, *but also* use group work and partner activities *when appropriate*.

At the present time, teacher-led lessons are often criticized as being 'transmissionist'— implying that teachers are trying to transfer information directly to students' minds by chalk-and-talk lectures and through the use of the textbook or information technology (IT). The modern 'constructivist' theories of learning suggest that this type of 'transmission' teaching is not very effective because it does not enable students to make meaning for themselves through their own actions and through discussions with others. Driscoll (2000, p.376) states, "Learners are not empty vessels waiting to be filled, but rather active organisms seeking meaning". However, it must be understood that high quality direct teaching (for example, a clear explanation by the teacher) is *one of the many ways* in which students can be helped to construct meaning. Effective teaching is much more complex than simply explaining things to students, but explaining and presenting information is still an important teaching strategy that plays a part in facilitating learning. Constructivist approaches in the classroom do not mean that all responsibility for learning is handed over to the students and that activity approach and group work must be used at all times and for all purposes. Mullis et al., (1997) point out that 'whole class teaching', *provided that it is not the only method of instruction used*, can be very efficient because it requires less time to be spent on management functions and provides more time for developing concepts and covering the curriculum. Teachers can make presentations, conduct discussions, demonstrate procedures and monitor students' progress with the optimum use of available time. However, in whole class lessons teachers must also respect what they know about:

- the limits of human attention span

- the need for students to participate actively in the lesson
- individual differences among students in terms of ability, motivation and skills.

These matters will be discussed in more detail later. The issue of whether schools should adopt a student-centred approach to learning rather than a teacher-directed approach remains controversial. Articles arguing strongly for one or other viewpoint will be found in Abbeduto's (2000) book *Taking sides: Clashing views on controversial issues in educational psychology*.

Criticisms of the 'effective teacher' model

It is sometimes suggested that the effective teaching model is too prescriptive (e.g. Davis, 1999); it seems to deny that teaching is in part a creative and spontaneous activity, and implies rather that following a simple recipe for instruction will produce good results. Critics suggest that the act of teaching is much too complex to permit analysis into component skills. Others hold opposing views and suggest that the effective teaching model is so important that it should be taught thoroughly and implemented in all teacher education courses (e.g. Reynolds, 2000).

It is also sometimes stated that what is described in the effective teaching literature is a 'behaviourist' position — the teacher controls the learning situation, the students respond, are in some way rewarded or reinforced, and learning takes place. This is a very inaccurate interpretation of the research work on effective classroom teaching. Learning and teaching obviously involve dynamic interactions between teachers and learners. Van Kraayenoord and Elkins (1998) have commented that when teaching is carried out as an *interactive process*, the teacher is sensitive to the characteristics of the students and *uses a wide variety of techniques* to respond to individual differences. Research has indicated that effective teachers are actually warm, concerned and flexible in their general approach to students (Wilén et al, 2000). This is also reflected in the comments made by students themselves. In the following list, notice that students are very conscious of both the pedagogical skills of good teachers and their empathic and caring characteristics.

Students' views of good teaching

According to Batten, Marland and Khamis (1993) and Morgan and Morris (1999) students describe a 'good' teacher in the following terms:

A good teacher:

- helps you with your work
- explains well so you can understand
- knows what he or she is talking about
- makes lessons enjoyable
- is friendly and easy to get on with
- is fair and straightforward
- cares about you; is always ready to listen; understands you
- has a sense of humour
- controls the class well.

According to a Year 8 student (quoted in McBer, 2000) a 'good' teacher:

- is kind
- is generous
- listens to you
- encourages you
- has faith in you
- keeps confidences
- likes teaching children
- likes teaching their subject
- takes time to explain things
- helps you when you're stuck

- tells you how you are doing
- allows you to have your say
- doesn't give up on you
- cares for your opinion
- makes you feel clever
- treats people equally
- stands up for you
- makes allowances
- tells the truth
- is forgiving.

Those of you who wish to explore the whole domain of effective instruction, classroom management, teacher enthusiasm and teacher expectancy in more detail, I refer you to the latest edition of *Looking in classrooms* by Good and Brophy (2003). In my view this is one of the best texts ever written for teachers who wish to reflect upon and improve their own classroom practices. Also useful for providing a balanced and informative overview of effective teaching and instructional design are: *Methods for effective teaching* by Burden and Byrd (1999), *Dynamics of effective teaching* (2000) by Wilen et al., *Universal teaching strategies* by Freiberg and Driscoll (2000), *Effective teaching strategies* by Killen (1998) and *Learning and teaching: research-based methods* (1998) by Kauchak and Eggen. Check the reference list on the Web for other texts and journal articles dealing with effective teaching.

It is beyond the scope of these notes to explore in detail each of the characteristics of effective teaching. The importance of many items in the list is, in any case, self-evident. Others aspects will be discussed later.

Here we will focus on four very important features of effective teaching:

- (i) clear presentations and explanations
- (ii) effective questioning
- (iii) the teaching of task-approach strategies
- (iv) adjusting instruction to individual differences.

SOME SELECTED FEATURES OF EFFECTIVE TEACHING

Presentations and explanations

Presenting information to children and providing explanations are two of the main activities in which teachers engage. In a methodology text titled *Explaining* Wragg and Brown (1993, p.3) defined successful explaining as 'giving understanding to another'. I stress here *successful* explaining as it is clear that a great deal of *unsuccessful* explaining also takes place in some classrooms. According to a study by Smith and Meux (1962; cited in Wragg and Brown, 1993) it appears that the greatest source of confusion in children is lack of precision and clarity in teachers' explanations. It is extremely easy to create learning problems for children through poor presentation of information and muddled explanations.

Effective teaching requires, above all else, *clarity in presentations and explanations*. Teachers striving for maximum efficiency in their daily work need to attend closely to issues of clarity. One of the most self-revealing activities teachers can engage in is to record on audio-tape an entire lesson, and later listen to the recording to appraise the quality and clarity of their own instructions and communications.

In describing the skills of what he terms 'clear teachers' Eric Sotto (1994) indicates that clarity involves:

- knowing your subject matter
- being able to see the subject from a new learner's perspective
- being able to explain things in simple terms.

Expert teachers who obtain consistently good results from students in their classes are reported to incorporate the following features within their lessons (Bush & Kincer, 1993):

- efficient initial presentations of new work
- clear and precise instructions
- a greater variety of ways of explaining topics
- more frequent revision of work.

Poor explanations usually get learners confused from the start, and therefore create learning problems. This occurs through a general lack of clarity, use of complex terminology, failure to draw analogies or to give examples to which the learner can relate, and presenting too much material at one time.

Explaining should not be a one-way process. A good explanation also embodies questions to the students to ensure that what is being said is making sense; and students should be encouraged to ask the teacher questions during and after an explanation. Perhaps the least helpful question for a teacher to ask students (but one that is frequently heard) is 'Do you understand that?' Very few students, especially those with a lack of confidence and those not doing well, are going to confess in front of the entire class that they don't understand. Students with learning difficulties are the least likely to seek clarification, especially once they have been in school long enough to learn that asking questions sometimes results in criticism from the teacher for not having listened! (Good and Brophy, 2003).

Of course, high quality explanations are not restricted to the teacher. Children can and do explain things to one another very effectively. Sometimes they are effective because they are able to relate easily with a fellow learner at a similar stage of development, and they use just the right language or examples to make a point clear. I still remember being taught how to carry out the long division algorithm by the boy I was sitting next to in primary maths class. He was for me a much more effective communicator, and much less threatening, than the class teacher. The fact that I can still remember this incident more than fifty years later must say something about the impact and value of *peer tutoring*.

The value of student-to-student explanation strongly supports the notion that collaborative and cooperative work in the classroom is an essential part of effective teaching and learning. Group work certainly increases the opportunity for productive discussion among students — which is something known to facilitate learning. It also supports the value of peer and cross-age tutoring as a classroom organizational strategy. These less-formal practices are often thought not to be compatible with the effective teaching model. This is quite untrue. Appropriate group work and cooperative learning activities are an essential part of effective teaching.

Questioning

Kauchak and Eggen (1998) state that questioning is the most widely used strategy in the classroom. It is used to instruct and to motivate learners and to diagnose their levels of understanding and reasoning. Effective teaching must involve careful attention to classroom questioning. According to Wasserman (1992) *asking the right questions is the essence of good teaching*. A sound guiding principle for all teachers was provided by Clopton (1992, p.30) when he wrote, '*Ask questions that build confidence*'.

Research on teachers' use of questioning indicates a connection between higher achievement and the types of questions asked (Cole & Chan, 1987). Teachers of classes showing the highest achievements were found to ask many questions during their lessons and a low proportion of questions that yielded incorrect responses or no response from the children.

It has been demonstrated that children with poor learning skills seem to benefit from instruction that includes a high percentage of simple direct questions focusing on the core content of the lesson (Brophy & Good, 1986; Hirsch, 2000). It is as if answering these questions helps to firm up a student's grasp of the topic. Most of these core questions are referred to as 'lower-order' questions, and it has been suggested that about eighty percent of classroom questions should be of this type. If students are struggling to assimilate basic facts, then it is usually necessary to ask more questions from this lower-order category. On the other hand, if development of critical thinking skills is the target then higher-order questions are necessary (Good & Brophy, 2003).

Another aspect of questioning that has been examined is the phenomenon of what is called '**wait time**'. Rowe (1978, 1986) analysed audio-tapes of lessons and discovered that teachers often asked

between three and five questions a minute, but allowed only a second or so for a child to respond before asking someone else or providing the answer themselves. When teachers deliberately extended their wait time to 3 seconds or more when they asked a question *and* after a student responded the following things occurred:

- the number of responses increased
- fewer instances of failure to answer occurred
- students' confidence in answering appeared to increase
- the length of the student's response increased
- the number of questions asked by the students themselves also increased
- contributions from lower-ability students increased.

Some common errors in questioning include:

- asking too many difficult or poorly worded questions
- continuing to ask questions even though the students have indicated lack of knowledge on the topic
- taking answers only from students who volunteer.

According to Cole and Chan (1987) questions should be used for the following purposes:

- to increase communication during the lesson
- to focus attention on key aspects of a topic
- to evaluate students' understanding
- to review essential content
- to stimulate particular types of thinking
- to motivate, hold attention, and control the group.

Teaching task-approach strategies

Let us now turn to the issue of teaching students how to go about their learning with maximum efficiency.

Perhaps the most important discovery to be made since research moved beyond the simple process-product studies is that it isn't only what the teacher does that is important. Students themselves may need to be helped to become more efficient in their approach to classroom learning. Effective instruction must include a focus on teaching students effective ways of approaching the tasks they are required to do in the classroom. This is of particular importance for students with learning problems who often exhibit poor or inefficient learning styles (Graham, Harris & Reid, 1992; Westwood, 1997).

When introducing new tasks, the teacher who says to the class, 'Watch me carefully and listen to what I say to myself as I do this', is likely to be paving the way for a successful first attempt by the students. Compare this with the teacher who almost always says, 'See if you can work this out for yourself'. This latter request (*although very valid in some learning situations*) can be an invitation to failure and confusion for students who lack confidence and are weak in independent learning. One of the ways in which we can improve learning outcomes for students at risk of failure is to become much more efficient in our presentation and modelling of *task-approach strategies*.

In task-approach strategy training students are explicitly taught, via clear modelling, demonstration and 'thinking aloud' by the teacher, precisely how to go about a specific task. In the typical classroom these tasks might include, for example, finding the meaning of an unfamiliar word in the text book, reading a page from the textbook and making a summary of the key points, planning and composing ideas for a piece of writing, solving a mathematics word problem, or researching a topic for a special project.

Usually the teaching of a strategy includes helping students 'think about their own thinking' in relation to the task at hand. We call this 'metacognition'. Students need to be taught useful *self-monitoring and self-correcting* habits. In other words, efficient teaching devotes much more time than usual to thinking about the actual *processes* involved in completing classroom tasks, as well as having regard for the quality of the product. 'How do we do this?' is as important as 'How did it turn out?'

Frequently, in less effective teaching, we assume that students have these task-approach and self-monitoring skills, or will develop them incidentally while undertaking the work. To avoid placing

some students immediately in a failure situation, it is much more beneficial to teach them first *how* to do the work.

Adapting instruction

The final component of effective teaching to be considered here is responding to differences among students — this is sometimes referred to as 'teaching adaptively' or 'differentiating instruction'. Adaptive instruction is defined as instruction geared to the characteristics and needs of individual students. Research seems to indicate that when skillfully implemented adaptive instruction improves student learning (Tomlinson, 1995).

Perhaps the most extreme form of adaptation to differences among students is reflected in moves toward individualized programming. In the past, a great deal has been written about the need to cater for individual differences among students by providing each child with his or her own unique program and allowing the students to learn at their own preferred rates. At one time this model was almost held up as the 'ideal', with computer-aided instruction and IT being one possible way to achieve it.

Recent thinking suggests that any extreme form of individual programming is a very difficult approach to use. Contemporary views on learning place great importance on social interaction among learners — something that tends to disappear if students are working alone (Hirsch, 2000). As Brandt (1992) has pointed out, the flaw in programs of individualization is that students tend to get further and further apart (not closer) in their attainments. Individualization tends to exaggerate and maintain differences among students, not close the gap. Many teachers also recognize that the trite comment 'a student must be allowed to learn at his or her own rate' is nonsense if the student is actually progressing much more slowly than is necessary. For some students it is essential that teachers intervene to *accelerate the rate of learning*, otherwise these children will simply fall more and more behind. Active and explicit group instruction from the teacher has this advantage of increasing learning rate (Good and Brophy, 2003; Westwood, 1998).

There may be very sound reasons for using individualized programs at times with students of very high ability (gifted students) or for those with severe learning difficulties or handicaps. However, rather than looking to complicated individualized programming to improve learning outcomes for most students it is more useful to consider how whole-class teaching, combined with appropriate and flexible grouping and inclusive practices can be made more adaptive to individual needs.

The term 'differentiation' is now used in many countries to convey the idea of adapting instruction to students' abilities. Rather than using individualized programs differentiation can be carried out through teaching the same curriculum content to all students but tailoring the teaching approaches and the learning activities to the different learning needs and capabilities of individual students. Wherever possible, this is regarded as preferable to setting up alternative courses, creating special classes, or streaming students by ability.

Effective teachers already do much to adapt the processes of instruction while lessons are in progress (Westwood, 1998; Fuchs & Fuchs, 1998; Scott, Vitale & Masten, 1998). For example, the following tactics are frequently observed during lessons when teachers are sensitive to differences among learners.

The teacher:

- simplifies and restates instructions for some children
- re-teaches certain students or provides an additional demonstration
- gives more descriptive praise to certain students
- praises some students more frequently
- rewards different students in different ways
- sets shorter-term goals for some students
- monitors some students more closely than others
- provides more (or less) assistance to students as they work
- accepts different quantities and qualities of bookwork
- asks questions of different degrees of complexity
- encourages peer assistance
- selects or creates alternative resource materials.

Some students need to be taught directly and carefully the knowledge and skills acquired easily by other students through incidental learning. This is particularly important in key areas such as literacy and numeracy where some students appear to benefit most from direct teaching. Failure to adapt ones' teaching approach may place at risk those students who require well-structured programs and direct teaching. Equally problematic, failure to extend and challenge gifted children through a more stimulating curriculum with greater scope for independent learning may result in boredom and under achievement. Achieving this balance between teacher-direction and student-centred learning is difficult to accomplish.

No one suggests that adapting the curriculum and modifying instruction to individual needs is easy. Several studies have indicated that teachers know that they *should* modify their approach for some students, but find this very difficult to do so in practice (Simpson, 1997; Schumm & Vaughn, 1998). However, effective teaching does require that teachers recognize different aptitudes and learning needs in any group of students.

It is becoming clear that a balanced approach to classroom teaching should combine at least three main types of experience (Alexander, 1995):

- 1 *direct teaching* (which instructs pupils explicitly in what to do and how to do it)
- 2 *enquiry* (which poses problems, asks challenging questions, and helps children to reflect and to think for themselves).
- 3 *scaffolding* (which supports student' learning so that they can move forward from their present level of understanding to the next level).

The human touch

Skilled teachers have something extra that sets them apart from less successful teachers. That 'something' appears to be a *positive rapport with, and genuine respect for, the students they teach* (Agne, Greenwood & Miller, 1994). Effective teachers blend their instructional skills with a more personalised and responsive approach to their students. Effective teaching combines human relationship skills, judgment, humour, intuition, knowledge of subject matter, and an understanding of different forms of learning, into one unified act, resulting in improved learning for students (Kauchak & Eggen, 1998). It is not difficult to understand what Snowman and Biehler (2000) meant when they said that good teaching is partly an art and partly a science. To be an effective teacher takes much more than technical knowledge about instructional procedures. A sound theory of instruction is of no value without the ability to get on well with students.

Summary

The following points taken from Harris (1998) provide a summary of some key evidence concerning effective teaching:

- Students learn most in classrooms that are well managed and provide clear structure and goals.
- Students who spend much of their time being instructed by teachers and working under direct supervision from teachers, make better progress than students who are expected to learn entirely for themselves.
- Time spent in study (time-on-task) is a very important predictor of achievement.
- Clear presentations, explanations, questioning and feedback (active teaching) are related to positive student learning.
- The pace of lessons influences participation and learning.
- The teaching 'environment' (including classroom climate and social interactions) influences learning.
- Different approaches to teaching are needed to obtain different desired outcomes.

Harris (1998, p.179) concludes: 'Effective teaching is linked to reflection, enquiry and continuous professional development and growth. Effective teaching requires *teacher commitment to be effective*'

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