

Using portfolio assessment as an innovation to assess problem-based learning in Hong Kong schools

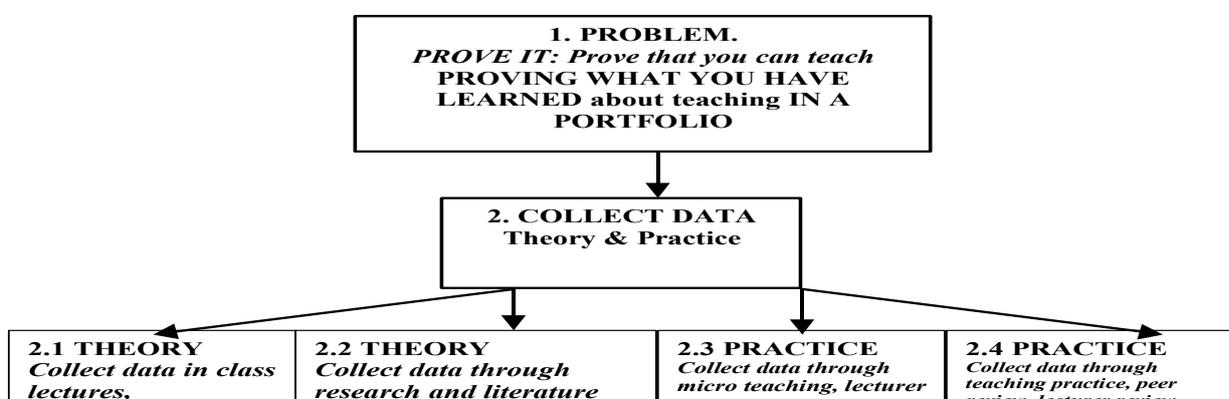
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This paper will build on the findings of a pilot study to investigate the extent to which portfolio assessment is implemented to assess Problem-Based Learning (PBL) by teachers and principals in Hong Kong. Schools are beginning to put into practice current educational reform directives, including reforming the assessment system. The researchers have applied portfolio assessment in teacher education as a foundation to portfolio assessment in schools, an important aspect of quality reform that appropriately assesses PBL. Currently portfolio assessment is underutilized in Hong Kong even though recent policy and reform documents have called for more authentic student assessment. Research has revealed that this is due in part to the fact that few educators thoroughly understand the impact this type of change will make, and have done little to prepare teachers or administrators. Therefore the findings of this study can significantly direct the work of education officials in a leadership role strategy for implementing alternative authentic assessment strategies, such as portfolio assessment for teachers, principals, and other educators.

INTRODUCTION

Assessment practices are critical to the teaching and learning processes. In a culture that is mainly based on an examination-driven system, the innovation using portfolio assessment has met with success. In Hong Kong it is somewhat easier to implement innovations in teacher education than in the public schools. The PBL approach was used in pre-service teacher education in Hong Kong to implement this innovation at two different levels using conceptual frameworks (Figures 1 & 2). The problem for trainee teachers was the real life teaching problem of learning to teach successfully in the classrooms of Hong Kong (Figure 1). The real life problem for the teacher education lecturers at Hong Kong Institute of Education (HKIEd) was to improve the teaching and learning processes by using portfolio assessment as the innovation and at the same time have their students learn about the assessment strategy of portfolio assessment (Figure 2). A PBL process was used to study and research the implementation of portfolio assessment in classes as well as in the teaching practice of students (Figure 2). At the same time the PBL process was utilized as students implemented portfolio assessment to illustrate and prove what they had learned in their program of study (Figure1).



To improve the processes of teaching and learning of the pre-service trainee teachers, lecturing staff made the decision to use an innovation, namely, portfolio assessment. Responsibility for learning and proving what they had learnt was handed to the student teachers who then through the PBL process had to prove in their portfolio what they had learnt. In the past, these students had been assessed mainly through examinations in their modules and school-based actual teaching practice, to prove they had learned the skills needed to be a teacher. The teaching team felt that this was not sufficient to help students become successful teachers. So to solve the problem of enhancing teaching and learning, trainee teachers had to practise assessing and assessment through a portfolio for modules such as Classroom Teaching Skills, Instructional Design Strategies and Practicum. Over the five years, the two authors have been doing this; two formal research projects on portfolio assessment have been conducted. The first was conducted with pre-service student teachers. As portfolio assessment seemed to be so successful according to the data analyzed, a second research project is currently in the pilot stage with some of these graduate students who are now teachers in the classroom as well as with other teachers and principals in the schools of Hong Kong. This paper will present some of the research findings from both of these research projects, relevant literature on the innovative use of portfolio assessment internationally, as well as information on the current and past status of the school system in Hong Kong. Discussion regarding the research processes and methodology will not be fully discussed due to the brief nature of this paper.

PBL Conceptual Frameworks Used

The students in this PBL process were given the problem of how to prove that they had learned the module content related to being a successful teacher in the classrooms of Hong Kong (Figure1). The problem they faced was how they gleaned the information and properly understood the data collected through lectures, reading, research, micro-teaching and actual teaching. After the data collection, they were faced with the problem of selection and organization of the data into the actual portfolio. The next step was for them through their own written documents to reflect on all they had learned over the course of the module (s) and/or teaching practice(s). This data had to be analyzed and presented in a professional manner for the lecturer(s) involved in the evaluation and assessment of their presentation. This presentation could include print, video or electronic materials. The lecturers were guided in this assessment process by an agreed set of rubrics. The student would also draw on the portfolio as a part of their professional portfolio to be used to improve their teaching practice. The lecturers also studied the information included in the reflections and the narratives in the portfolios to improve their instruction and the module content (Figure 2). The team of lecturers in true PBL spirit were themselves solving a real life problem, which was that of the students learning to teach. So the PBL process itself was operating for the lecturers who also wanted to make it work for the students.

Over the five years the team has collected, analyzed and acted on data collected through the two research projects, as well as through the data collected in the actual portfolio narrative and reflections. In addition to conducting extensive literature reviews on portfolio assessment and how this could impact PBL, the team collected both quantitative and qualitative data through questionnaires and in-depth interviews with hundreds of students, teachers, principals and lecturers.

HONG KONG EDUCATIONAL REFORM

Hong Kong schools, like schools internationally, are moving toward reforming the assessment system which calls for the inclusion of the use of portfolios. Currently portfolio assessment is underutilized in Hong Kong even though recent policy and reform documents have called for this type of alternate and authentic student assessment for years. The recent Education Commission report calling for reform in the assessment system speaks to a more site-based assessment model for schools to embrace. The Hong Kong Education Commission, in recent efforts to reform education in Hong Kong, has considered it a top priority to reform the systems of assessment, public examinations and school places allocation. One of the issues under consideration to accomplish this goal is to inculcate a self-evaluation culture in schools. However, few education officials (just like those in other countries when this type of reform began) thoroughly understand the impact for such an assessment strategy and have done little to prepare appropriate staff development and organization reengineering programs to prepare teachers and administrators (Hong Kong Special Administrative Region Education Commission, 1999, p.21).

To implement this type of innovation is never easy. However, using a PBL approach (Figures 1 & 2) seemed an innovative strategy for the team to embrace strategy to solve this problem. According to Cagwin (1997),

Problem-based learning has been described as a promising approach to professional development of educational leaders. This approach to learning is problem-centered and requires the learners to draw upon knowledge from many subject areas in an integrated manner, and work through a collaborative group process to obtain a successful solution to the real-life problem. In addition PBL is an instructional strategy that is based on a constructivist philosophical position, which matched the approach used in the modules taught by the authors. It also offered promise as PBL is a professional preparation strategy that uses cross-disciplinary problems as the starting point for learning. These problems are similar to those the students might face in their future role. Students work in groups, and the professor (lecturer) functions as a facilitator.

Therefore the team felt a PBL approach would benefit us as the lecturers would learn not only about portfolio assessment, which was an innovation new to the Institute, but also about ourselves as professionals introducing this innovation to Hong Kong students. At the same time, we would learn about the students themselves through the portfolio narratives and reflections. The students would benefit as they would learn more about themselves as learners and teachers, and at the same time they would learn about the use of portfolio assessment that they could later use in the future classrooms of Hong Kong. It was therefore felt that a PBL approach to portfolio assessment would result in a win-win situation.

TEAM APPROACH

Based on previous research both authors felt a team approach to solving both teaching and learning problems (Figure 2) and proving that one can teach using a portfolio (Figure 1) was necessary. This decision was based on the assumption that the problem they were solving would improve their skills as a teacher and that working together would also improve their

communication and planning skills. Bryant (1995) found that educational work accomplished through total participation, such as that of teams, means that individual workers join with others to plan, deliver, and assess work done. Quality teams utilize the many talents brought to the workplace by workers, and invite collaboration that respects various work experiences and contextual differences of employees. Total participation and empowering the individual to be responsible for decisions made related to the working environment seems to be one that will support systemic change (Bonstingl, 1992a; Juran, 1989; Kearnes, 1989; Rhodes, 1990a). For it is in the overall knowing that a team can have all parts of a system's impact that a single individual cannot know. Part of the activities that students undertook during the portfolio assessment process was to begin to link theory and practice through their narratives and reflections. They had to work as a team to solve many problem-based situations related to the portfolio. They often divided up the task, did separate research and then pooled their findings to make a complete solution. Students over the years continue to report that the discussions and working as a team to approach the portfolio and to solve the problem of proving they can teach has been beneficial.

According to Walkington (1991, p.23), when applied to an educational system all segments of the school community need to be involved in the shared decision-making process and need training to be effective. However, cautions Walkington (1991), "... shared decision-making takes time, trust, and hard work to implement. This warning is critical to teams of educational leaders as they plan for the implementation of this type of assessment strategy. We were careful to allow time for students to develop trust for each other and for their lecturers in this PBL approach. We have found that some of these students, five years later, are still using the skills they developed under our tutelage to be more effective teachers.

USING THE PORTFOLIO APPROACH IN HONG KONG

The "Development of Assessment Approaches for Learning" Project, undertaken by the HKIEd team in 1996-1998 to investigate the use of portfolio student assessment in initial teacher training staff at HKIEd, found that the study supported the body of research (a small sample of which will be presented below) on student assessment that has found that the use of portfolios for student assessment in teacher education supports the current emphasis on meaning in learning and the need for the learner to adopt an active PBL role in the learning process. In the constructivist perspective of learning, students actively construct their meaning from their learning experiences as opposed to recalling facts. Constructivism calls for one to actively make sense of new knowledge and decide how to integrate it with previously held concepts and information. As Engel (1994) has highlighted, this emphasis in the contemporary meaning-based pedagogies requires a rethinking of the 'instruction-curriculum-student assessment triad'. The next level of investigation related to this "rethinking" for the HKIEd team has been to identify the successful implementation practices of alternative non-traditional authentic student assessment needs in the schools in Hong Kong as many recent reports are calling for their further and more extensive implementation. This work has become a pilot study of portfolio student assessment called "Portfolio Assessment Use in Schools" Project. In this study, ten schools in Hong Kong have responded so far to our questionnaire. In addition, teachers and principals in five schools, both public and private, have been interviewed. However, a more extensive and exhaustive study must be undertaken because there needs to be a thorough study in order to develop appropriate models for the full implementation to be as successful as possible for all Hong Kong schools.

Research in both studies has shown that this type of PBL approach to student assessment has made an impact on curriculum and pedagogy, such that student assessment interactions between lecturer and student(s) promoted increased learning due to their discussions and reflections around the collection of work. Using the real life problem of proving one has learned to teach and using the PBL conceptual frameworks (Figures 1 & 2) for improving teaching and learning has indeed enhanced both teaching and learning in classrooms for all who have used this portfolio assessment approach. The following are some of the points of discussions learned over the last five years using this PBL approach to portfolio assessment.

Perceptions On The Use Of Portfolios In Student Assessment

The 1996-1998 research team using PBL techniques (Figures 1 & 2), which investigated the use of portfolio assessment in the classrooms of HKIED, found that:

- Student self-evaluation is an integral part of student assessment
- Alternative non-traditional student assessment provides a new perspective on learning
- Teachers need to continue to develop implementation student assessment to enhance student learning
- Teachers need to devote more time and effort to evaluation for formative purposes
- The implementation of student self-evaluation requires corresponding changes to pedagogy and curriculum
- The teacher's role is vital in developing a structured learning environment where students are given independence in their learning
- The learning outcomes for students and teachers include the improvement of organization, evaluation skills, memory, personal growth, cooperation, reflective practice, self-reliance, independence and action planning

The "Portfolio Assessment Use in Schools" Project using the PBL approach (Figures 1 & 2) undertaken by the research team in 1999-2000 to investigate the use of portfolio student assessment in the public and private schools of Hong Kong has not yet been completed to the stage of analyzing all of the returned questionnaires and in-depth interview data. Initially the research shows that it appears few public schools are using this type of assessment method. However it is being used in a variety of ways in some of the non-public schools in Hong Kong. In addition this study is finding that:

- Portfolios can help to solve the authentic assessment reform proposals utilizing PBL techniques
- Learner becomes empowered as they are immersed in PBL strategies
- Reflection is critical from their PBL experiences
- Student learning is enhanced with a PBL approach
- Gender makes a difference when using PBL as a basis for learning.
- Portfolio assessment takes time
- The team approach works well in this PBL context

In both of these studies which used a PBL approach the findings indicate that portfolio assessment is of value. The following discussions are some of the things that the team has identified through research and literature reviews as the most valuable and essential to understanding the problem of proving one can teach and the assessment of that learning.

PORTFOLIOS SOLVE PROBLEMS OF CURRENT ASSESSMENT STRATEGIES

The introduction of portfolios, and other forms of performance-based student assessments, reflects increasing dissatisfaction with other student assessment methods. Since traditional assessments do not attend to process and authenticate, educators (Burke, Fogarty & Belgrad, 1994; Engel, 1994; King, 1991; Zollman & Jones, 1994) have indicated that better approaches need to be implemented. In traditional tests, students compete against each other for success rather than for authentic assessment. Little wonder that students rarely understand traditional assessments. Engel (1994, p.24) has described the shift as follows:

Classroom assessment is moving from expediency (i.e. standardised testing) toward authenticity. It is assuming broader responsibilities and a somewhat different mission: to assist teachers, schools, and school systems in accepting children wherever and whoever they are, and to provide them with equal access to education and with the means to live up to their potential.

Biggs (1996) says that the problem in Hong Kong is the way teachers and parents think about assessment, which is in quantitative terms that embrace not only learning and its assessment but dictate a transmission model of teaching in which many believe strongly. Depending on course objectives, assessment methods should be as open as possible to different kinds of relevant learning (p. 313). The function of assessment changes, from one of selecting students which is no longer necessary, to one that gives information on the skills, and competencies of individuals (p. 12). It requires reconceptualization of the nature of learning strategies, including educational assessment. So to move towards this type of reconceptualization of assessment for future generations, one must understand what the actual picture of these types of assessments is for Hong Kong and then design strategies to continue the move toward more authentic assessment, that is, more about giving information on the skills and competencies of each individual student. A PBL approach to using portfolio assessment for student assessment such as the one outlined in Figures 1 and 2 do just that.

Good student assessment practice has been described as student assessment that supports learning and reflection, including formative student assessment. Gipps (1997) has highlighted the need for student assessment to be open and linked to clear criteria. She also advocates the use of a range of student assessment strategies so that all learners have a chance to perform well. The use of portfolios for student assessment which she suggests is an example of this type of good practice.

Learners Are Empowered When Using Portfolios

Our data in both studies found that students were more empowered learners. Like Lyons (1998) who advocates the use of portfolios as an empowering activity from three perspectives: as a credential; as a set of assumptions about teaching; and as making possible a powerful, personal reflective learning experience, we found students were able to use their portfolios to do all three. Schulman (1985) asks about the vision of teaching which underlies a portfolio maker pointing out that the portfolio serves its most significant purpose: as a scaffolding for reflective teacher learning. Instead of presenting a set of courses and credits earned for purposes of credentialing and certification, the teacher stands at the centre of his or her own learning, defining and defending the authority of the credential. Paradoxically, the very personal aspect of the portfolio simultaneously serves another purpose. It makes public

and concrete what teaching is all about, and holds up to consideration and scrutiny the question of what constitutes effective teaching for the individual and a profession (p. 4) thereby empowering the individual to be more in charge of their learning. We also found that this PBL approach to their learning and reflection helped them to articulate what they knew about teaching and what they needed to be more effective. They could also suggest to us what the government needed to do in order to implement portfolio assessment in their schools.

Reflection Is Critical To Portfolio Assessment

Lyons (1998) points out that using reflection changes one's practice and that an essential skill for the use of portfolio is the development of reflectivity. One of her students reports;

It struck me that the things I found important (in our conversation) are the things that I would call the cornerstone of whatever my personal teaching philosophy is. [For example]...talking about the importance of culture and how it effects what I do in the classroom and how I think it would affect any teacher in thinking about the culture of the class...] (p. 104)

This very aspect of portfolio assessment links to the real problem students were solving for themselves. Using a portfolio assessment approach, students were able to write narratives about their attempts to do this in their classrooms. Psychologist Jerome Bruner offers one way of thinking about the role narratives play in the portfolio process. Bruner argues that there are two modes of knowing: the more traditionally acknowledged "pragmatic" or logical-scientific model; and a narrative mode. Bruner (1986) characterizes the differences between the two as irreducible. Each also provides ways of organizing representations in memory and of filtering the perceptual world. Efforts to reduce one mode to the other inevitably fail to capture the rich ways people "know" and describe events around them. As Rorty recently put it, one mode is centred around the narrow epistemological question of how to know the truth; the other around the broader and more inclusive question of the meaning of the experiences. The imaginative application of the paradigmatic mode leads to good theory, that is, logical proof, and empirical discovery guided by reasoned hypothesis. The imaginative application of the narrative mode leads instead to good stories, gripping drama, and believable historical accounts. It deals in human or human-like intention and action and the vicissitudes and consequences that mark their course (pp. 97-98).

Bruner identifies two aspects of narrative knowledge: the focus in narrative on the dual landscape of action and consciousness. These two compelling aspects of narrative may be what make the portfolio interview important to teacher educators. Through the reflective interview, these insights and learning become accessible both to the teachers, and more importantly, to their teacher educators.

Using Portfolio Assessment Enhances Student Learning

By cultivating a more reflective attitude towards learning and introducing a PBL contextual approach, our students felt empowered whilst at the same time improved both communication and subject skills. Using portfolio assessment in the classroom led to changes in the way our students began to think about themselves and their learning and as a result, how they began to learn more about themselves as learners. Schulman (1985) asks about the vision of teaching which underlies a portfolio pointing out that the portfolio serves its most significant purpose: as a scaffolding for reflective learning. Paradoxically, the very personal aspect of the portfolio simultaneously serves another purpose. It makes public and concrete what teaching and learning is about. Similarly our students were better able to articulate what it meant to learn and what it meant to teach as they wrote their reflections.

Assessment reform, the shift towards performance-based assessments and away from multiple-choice, norm-referenced tests, is based on the assumption that performance assessments are more pedagogically valuable and more accurate reflections of student achievement than are multiple-choice tests. Specifically, assessment reform is based upon the assumptions that:

- Performance assessments support the teaching and the learning of problem-solving skills, critical-thinking skills, and multidisciplinary understanding — all of which are essential for enhancing student achievement
- Assessing student performance against established standards is better than assessing performance against group norms, and
- Performance assessments provide a better measure of student strengths and weaknesses than do multiple-choice tests. In addition, many educators claim that performance assessments are more interesting for students, and, therefore, engage students in the assessment process

This type of qualitative methods of assessment is based on a Constructivist model of teaching and learning. Catherine Twomey Fosnot points out in the “Preface” to *The Case for the Constructivist Classroom*,

Constructivism is not a theory about teaching. It’s a theory about knowledge and learning. Drawing on a synthesis of current work in cognitive psychology, philosophy, and anthropology, the theory defines knowledge as temporary, developmental, socially and culturally mediated, and thus, non-objective. Learning from this perspective is understood as a self-regulated process of resolving inner cognitive conflicts that often become apparent through concrete experience, collaborative discourse, and reflection. (p. vii)

Constructivism has important implications for assessment and the use of PBL strategies in the learning process. In particular, grading should be holistic; the assessment performance should be evaluated as a whole, not in bits and pieces. Using feedback from assessment to improve teaching and learning is an integral part of the school curriculum. The feedback from assessment should be effectively used to improve teaching and learning. The different purposes and modes of assessment, for example, objective tests, projects or portfolios need to be distinguished and made clear to schools so that they are consistent with different curriculum aims, teaching/learning processes and contents.

The California Assessment Collaboration (1993) stated:

Meaningful assessment data in the hands of a teacher with the capacity to use it well increases the likelihood of improved instruction. But only when students also have access to meaningful assessment data and the ability to use it will they have the capacity to improve their performance. (p.54)

Students are the passive recipients of most traditional assessment data. Alternative assessment strategies have the potential through PBL to involve students in the evaluation of their own work, by teaching them to understand what their work reveals about their achievement and to identify what to work on to improve their performance. The choices made in designing and implementing alternative strategies will have a great deal of impact on whether the assessment can be used in these ways (p. 56). To implement such type of assessment means that one needs to:

- Communicate standards to students
- Provide a structure for self-assessment
- Provide meaningful feedback to students, and
- Build learning cultures

A review of 1500 schools by Newmann and Wehlage (1995, p.10) found that successful schools focused on “authentic” pedagogy (teaching that requires students to think, and to develop an in-depth understanding, and to apply academic learning to important realistic problems) and student learning. Especially authentic assessment tasks such as portfolio assessment must focus on the following types of tasks:

- Construction of knowledge
- Organization of information
- Consideration of alternatives
- Disciplined Inquiry
- Disciplinary content
- Disciplinary process
- Elaborated written communication
- Value beyond school
- Problem connected to world beyond classroom
- Audience beyond school

Gender Makes A Difference

Another interesting finding from a review of the literature has been that not only does it take time but also there are gender differences in the use of portfolios. Black (1994) points out gender differences in writing for portfolios. When implementing portfolio assessment in teacher training institutions, because most of them are typically female, the issues of the different writing styles of males and females must be part of the understanding instilled not only in trainee teachers, but also must be part of their repertoire as they work with students to implement portfolio assessment (p. 235) This issue has become important, as HKIED is a teacher training institute with mostly female students. Students must also be trained to be

aware of this issue as they use portfolio assessment in the classrooms of Hong Kong. Gender approaches to PBL strategies provide additional information for the projects.

Portfolio Assessment Takes Time

In the United States where the use of portfolio has been in the schools for over 20 years, much has been written that indicates that it takes quite a bit of time for development and implementation. They have been used in a variety of ways all the way from kindergarten to postgraduate higher education. Each arena has found similarities and differences in the development and in the implementation. In Hong Kong, portfolio assessment has just begun to take hold and is being called for in the reform documents. One of the issues under consideration is to inculcate a self-evaluation culture in schools (Hong Kong Special Administrative Region Education Commission, 1999, p. 21). In view of the fact that this type of assessment is just beginning to be used in Hong Kong it was no surprise to us to find that very few public schools are using this strategy and that only some of the private schools are. We would forecast that using a PBL approach as they move forward would ensure a smoother and more logical implementation not only of the move to authentic assessment but also of the wider educational reforms.

SUMMARY

The team at HKIEd has spent the past five years heavily involved in PBL strategies to study portfolio assessment in the Institute with the student teachers, and are just beginning to investigate their use in the schools in Hong Kong. The extensive review of the literature has revealed extensive benefits for the use of portfolio assessment for all levels of education. The research projects are continuing to reveal the causes and consequences. Levels of acceptance, successful and unsuccessful techniques and attitudes are in the process of being identified. School subject teachers' and principals' perceptions are being assessed with respect to the implementation process of portfolio assessment, its strengths, weaknesses and limitations. Constraints and problems identified with the use of portfolio assessment in the schools and, its classrooms are beginning to reveal themselves.

As schools move toward reforming the assessment system, researchers feel the use of portfolios is an important aspect of quality reform that can be used to better assess problem-based learning. Education leaders will need to plan sufficient time and resources for the proper implementation of portfolio assessment. Teachers and principals need to understand the added value and empowerment that come from using portfolio assessment for all involved in the process. There needs to be a full understanding of the skills needed for reflection and narrative writing at all levels of the system. Educational leaders must also attend to the gender issues that this type of assessment will create. However the research is clear that with proper planning using the PBL approach, a team can implement this assessment strategy successfully. The payoff for enhanced student learning is well worth the investment of time, energy and other resources. The authors also suggest that appropriate staff development needs to be designed for all levels of the system, including parents and the community. All stakeholders in a student's learning need to be involved in this PBL approach to enhancing student learning.

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