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# The Effects of Work Journals, Portfolios, and Cosmic Education on Intrinsic Motivation in an Upper Elementary Montessori Environment

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The Effects of Work Journals, Portfolios, and Cosmic  
Education on Intrinsic Motivation in an Upper Elementary  
Montessori Environment

An Action Research Report

By Heather Brown

The Effects of Work Journals, Portfolios, and Cosmic Education on Intrinsic  
Motivation in an Upper Elementary Montessori Environment

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### Abstract

The purpose of this research was to explore the effects of work journals, portfolios, and cosmic education on intrinsic motivation. The study was performed at a Montessori school in Indiana that serves children from birth through high school graduation. Thirty-four learners in an upper elementary classroom participated in the study over the course of eight weeks. Data collection included two pre- and post-assessments, daily observations, and interviews with participants. Results of the pre- and post-assessments showed an overall decrease in both extrinsic and intrinsic motivation, although learners perceived their work as having greater value and importance. Observation data revealed an increase in desirable behaviors over the course of the study. Interviews indicated that learners enjoyed the interventions and felt they were helpful. The results of this action research suggest that the use of work journals, portfolios, and cosmic education increase engagement and flow in the learning environment.

*Keywords:* intrinsic motivation, flow, work journals, portfolios, cosmic education

As a teacher, there is nothing quite as satisfying as watching a child discover something new. You see her eyes light up and her concentration intensify. She seems joyfully renewed as she delves deeper into her task. Her sense of accomplishment is palpable, yet she seeks little outward recognition. These are the wondrous attributes of discovery; the manifestations of an intrinsically motivated learner. Maria Montessori once described a young child working so intensely with a material that even Montessori's most obvious efforts could not distract her from the task at hand. At one point Montessori even lifted the child's chair without breaking her focus! My experiences as an upper elementary Montessori teacher have revealed that this level of exceptional concentration and exploration is regrettably not as prevalent as children grow older. Studies show that the use of extrinsic motivators, common in many school and family settings, decrease intrinsic motivation as children age (Ledford, Gerhart, & Fang, 2013). Even in Montessori environments, state and federal education requirements often curb child-directed learning over time in favor of academic benchmarks. While it may be assumed that the education of children has progressed throughout the centuries, it remains archaic in countless ways, suppressing the child's natural tendencies to learn. To this Montessori spoke:

What a marvelous characteristic in this creative spirit of humanity which springs forth independently of every form of education or instruction; this great spirit which transforms the environment like a god, which pierces the mountains, conquers the air and eradicates distance, this creative spirit of humans which enables them to perform such marvels independently of human teachers, which

creates civilization as the pearl oyster creates the pearl, the *Madre* peal, the coral, the bees, the honey and wax, this, this is the genius of humanity. (2013, p. 12)

It is with Montessori's confidence in man's innermost desires to learn in mind that I explored the body of research on motivational theory. I then used the information to conduct a study designed to bolster intrinsic motivation in upper elementary children.

This research took place over an eight-week period at a public charter Montessori school in Indiana. The school serves nearly 600 learners from birth through high school graduation. Participants in the study included 34 nine- to twelve-year-old learners in a mixed-age classroom with two teachers.

The study has significant implications for classrooms, as motivation is the driving force behind our daily decisions. While extrinsic factors such as grades, reward systems, and the opinions of others can be strong motivators, *intrinsic* motivation ultimately results in greater life satisfaction and stands the test of time. Deci and Ryan (2000) described intrinsic motivation as "the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (p. 70). Montessori used the term *horme* to describe this internal drive (as cited in Duffy & Duffy, 2012). "When he (the child) is developing, he perfects himself and overcomes every obstacle that he finds in his path. A vital force is active within him, and this guides his efforts towards their goal. It is a force called 'horme'" (Montessori, 1984, p. 90). Pink (2009) insisted that intrinsic motivation is the key to achievement as an individual progresses through life. In his words, "The science shows that the secret to high performance isn't our biological drive or our reward-and-punishment drive, but our third

drive—our deep-seated desire to direct our own lives, to extend and expand our abilities, and to live a life of purpose” (p. 30). Naturally, motivation theory has powerful implications for education. Standard practices in the educational setting detrimental to intrinsic motivation include grades, reward systems, deadlines, threats, and imposed goals (Ryan & Deci, 2000). Fortunately, there are practical ways to foster intrinsic motivation in classrooms by capitalizing on the internal drive of human nature, centered around the principles of interest, competence, autonomy, and relatedness. This section examines the research behind each of these principles and concludes with practical implications for a Montessori classroom.

### **Literature Review**

#### **Interest**

In order for an individual to be intrinsically motivated, there must be a degree of interest. According to Deci and Ryan (2000), interest is the key differential between intrinsic and extrinsic motivation. There are two types of interest: personal and situational. Personal interest “represents an individual’s relatively enduring disposition to be attracted to, to enjoy, or to like to be engaged in a particular activity or topic” while situational interest is “a psychological state of being interested in a task or activity that is generated by the interestingness of the task or context” (Pintrich, 2003, p. 674). In other words, a child’s longstanding fascination with dinosaurs is an example of personal interest while the feeling of intrigue experienced when listening to an engaging lecture is an example of situational interest. Higher levels of both personal and situational interest are associated with more cognitive engagement, more learning, and higher levels of

achievement (Pintrich, 2003). Duffy and Duffy (2012) related interest to content by aligning current motivation theory with their own personal experiences as teachers and teacher trainers. They concluded that in order to generate interest and enhance intrinsic motivation, content must be examined on the levels of its relevance to daily life, its attraction as a means of self-development, its emotional content, its place in a larger context, and its relation to the purpose of life itself (Duffy & Duffy, 2012).

### **Competence**

Competence is also important for supporting the development of intrinsic motivation. According to Pintrich (2003), “when people expect to do well, they tend to try hard, persist, and perform better” (p. 671). Competence encourages individuals to pursue mastery goals, which are more effective than performance goals (Seifert, 2004). It is important to note that mastery goals are more frequently adopted in the absence of extrinsic motivators. Lillard (2007) states, “When one’s primary goal is to learn, rather than to do well on a test, one is less likely to avoid what one does poorly at and more likely to gravitate toward what is challenging.” Competence is enhanced by Goldilocks tasks, or tasks that are not too difficult and not too easy.

...success at a challenging task builds the self-confidence necessary to attempt new challenges. This brings us to what we have called the “Goldilocks Principle,” setting a challenge that will be just hard enough to be interesting but not too hard so as to bring about failure. (Duffy & Duffy, 2012, p. 116)



Referred to as the *zone of proximal development* by education psychologist Vygotsky (1978), this “sweet spot” is crucial for learners to be engaged and motivated when completing a challenge. The Goldilocks Principle can ultimately result in a state of consciousness called “*flow*—the state in which people are so involved in an activity that nothing else seems to matter” (Czikszentmihalyi, 1990, p. 4). Pink described flow as a time when “we lose a sense of ourselves, we’re in the moment, and we’re deeply engaged” (Azzam, 2014, p. 15). Czikszentmihalyi and Pink’s descriptions sound strikingly similar to Maria Montessori’s concept of normalization through intense focus on an activity. Therefore, in order to achieve flow or normalization, the pinnacle of intrinsic motivation, an individual must feel competent by engaging in Goldilocks tasks.

### **Autonomy**

Another factor that contributes to intrinsic motivation is autonomy, or a “sense of choice, volition, and freedom from external pressure toward behaving or thinking a certain way” (Ryan & Deci, 2000, p. 70). According to Pintrich (2003), “students who believe they have more personal control of their own learning and behavior are more likely to do well and achieve at higher levels than students who do not feel in control” (p. 673). In relation to the previous principle, studies show that a lack of autonomy negates the benefits of competence on intrinsic motivation (Ryan & Deci, 2000). It is the partnership between autonomy and competence that allows individuals to set mastery over performance goals and avoid patterns such as “failure avoidance” and “learned helplessness” (Seifert, 2004). For optimal autonomy, choice should be offered in four areas: what people do, when they do it, how they do it, and whom they do it with (Pink,

2009). Katz and Assor (2007) looked more closely at the motivating properties of choice and determined that the act of choosing is not in-and-of-itself important; rather, “when a given choice provides an opportunity for self-realization it is experienced as autonomy-supportive, and therefore as motivating” (p. 432). Stated another way, picking, or “choice without preferences,” is not as motivating as choosing because it “does not affect people’s interests, volition, goals, and values” (Rescher, 1960). A concept related to choice and autonomy is Maria Montessori’s auto-education, or “the ability of children to educate themselves and develop their human personality by their own activity” (Duffy & Duffy, 2012). While the ideas of choice, autonomy, auto-education, and intrinsic motivation are similar, they are distinct in that the first two when partnered with a prepared environment, are the means to the latter.

Autonomous learners are, by definition, intrinsically motivated. Students cannot auto-educate unless they are driven by their own internal engine, and their smiles are the outward sign that that engine is functioning.

Conversely, auto-education feeds intrinsic motivation. The more students become autonomous learners, the more intrinsically motivated they are.

The two are complementary ideas in Montessori theory, in a sort of chicken-and-egg way. One does not come before the other—they occur simultaneously in the experience of the students. (Duffy & Duffy, 2012, p.

37)

**Relatedness**

Most researchers agree on a fourth factor that nurtures intrinsic motivation: relatedness (Crow, 2009; Duffy & Duffy, 2012; Lillard, 2007; Ryan & Deci, 2000). “Intrinsic motivation (is) more likely to flourish in contexts characterized by a sense of security and relatedness,” Ryan and Deci pointed out, which is consistent with studies showing how security and maternal autonomy support predict more exploratory behavior in infants (2000, p. 71). Anchor relationships, or “people who supported their interests and information seeking behavior”, are a common factor between the most intrinsically motivated learners (Crow, 2009, p. 103). These relationships are not limited to adults. Collaboration between learners is a powerful motivating force, especially during the highly social elementary years. Lillard suggested that this is explained by the effects of *incorporation*, which involves imitation of modeling by a more expert student; *distributed cognition*, the synergistic effect of sharing ideas; *active learning*, because everyone in the group is required to contribute actively; and *motivation*, because it allows students to pursue their natural need for socialization at this age (Lillard, 2007). An added outcome is that collaboration encourages the internalization of less intrinsic motivators, since individuals might engage in, and enjoy, activities with their friends that they wouldn’t have otherwise (Ryan & Deci, 2000). “Montessori education clearly leverages the power of elementary children’s social tendencies as a means of fostering motivation” (Murray, 2011, p. 31). Three-year age groupings, frequent small group work, regular teacher conferences, and class meetings make the Montessori environment extremely conducive to fostering relatedness.

### Implications for a Montessori Environment

Based on the large body of research surrounding motivation theory, Montessori teachers can adjust their practices to amplify interest, competence, autonomy, and relatedness. Murray (2011), Duffy, and Duffy (2012) offered suggestions (Table 1):

Table 1

Interest	Competence	Autonomy	Relatedness
<ul style="list-style-type: none"> <li>• Cosmic Education studies</li> <li>• Intimate understanding of students' interests</li> </ul>	<ul style="list-style-type: none"> <li>• Observation to gain knowledge of student ability</li> <li>• Encourage learners giving lessons to other learners</li> </ul>	<ul style="list-style-type: none"> <li>• Increased practice time</li> <li>• Class Bill of Rights</li> <li>• Protect engaged children from interruption</li> <li>• Regular student conferences</li> <li>• Work journals</li> <li>• Going-outs</li> <li>• Centering activities</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly class meetings</li> <li>• Community building</li> <li>• Grace &amp; courtesy lessons</li> <li>• Peace education</li> </ul>

*Table 1.* Suggestions for increasing interest, competence, autonomy, and relatedness.

While many of these practices are commonplace in most Montessori environments, they are not always utilized in the most effective way. It is important for teachers to evaluate themselves, their environment, and make modifications to maximize the potential for student motivation. In this way, Maria Montessori's vision of auto-education can be achieved. In order to improve motivation in my upper elementary classroom, I implemented learner created portfolios, replaced work plans with work journals, and increased emphasis on cosmic education studies. The objective was for these adjustments to bolster interest, competence, autonomy, and relatedness in the environment, ultimately resulting in increased levels of motivation.

### **Methodology**

The collection of data on intrinsic motivation took place over ten weeks. All thirty-four learners in the upper elementary classroom participated in the interventions and consented to have their anonymous data included in the study. Of the thirty-four, seven learners received special education services. The study included specifically chosen interventions intended to increase levels of intrinsic motivation by providing interest, autonomy, challenge, and context. Learners engaged in these interventions as part of their normal work activities for the duration of the study. Portfolios created and maintained by learners provided an opportunity for autonomy (they chose what to include) and challenge (they created pieces representative of their best work). Learners used work journals to keep a daily record of their learning, which allowed for more autonomy than teacher-directed work or work checklists. These work journals were partnered with regular conferences with me or my co-teacher to help the learner choose work across the curriculum that was exciting and challenging for them. Finally, I gave more emphasis on cosmic education through individual, small group, and large group lessons.

At the start of the study, I explained my action research project to the learners and gave them two pre-assessments from [selfdeterminationtheory.org](http://selfdeterminationtheory.org). The first, entitled Intrinsic Motivation Inventory (IMI), “assesses levels of interest/enjoyment; perceived competence; effort; value/usefulness; felt pressure and tension; and perceived choice” when engaging in an activity (“Intrinsic Motivation Inventory,” 2015) (Appendix A). The second, entitled Self-Regulation Questionnaire (SRQ), “assesses the degree to which an

individual's motivation for a particular behavior or behavioral domain tends to be relatively autonomous versus relatively controlled" ("Self-Regulation Questionnaires," 2015) (Appendix B). The learners who received special education services took modified versions of the assessments also provided by [selfdeterminationtheory.org](http://selfdeterminationtheory.org).

Interventions began at the start of the school year with the introduction of work journals. Most learners had worked with a more structured check-off list in past years, so time was taken to learn how to use a work journal. Each day learners were asked to record the date and what they worked on in list or narrative format. They also made a list of goals that they hoped to accomplish the following day. My co-teacher and I briefly looked over the work journals daily at the end of the work cycle and gave immediate feedback as needed.

Three weeks into the school year I introduced advisory meetings. Learners did not have advisory meetings in years past, so this was an entirely new concept. The 34 children were divided into two groups of 17. I met with half of the learners each week, and my co-teacher met with the other half. Each meeting lasted 10-15 minutes. During this time we discussed possible goal areas and student interests, reflected on the week, and set social, emotional, and academic goals for the following week. I kept conversation points in a shared Google doc that was accessible by the learner, the child's family, and support staff. As advisory meetings went on, some learners were able to lead their meeting and set challenging goals without much prompting while others required additional support.

Near the beginning of the school year, learners created accounts through Pathbrite for an electronic portfolio. We did a full group lesson in the computer lab to learn the basics, and then I followed up with more in-depth lessons with individuals as needed. Learners were asked to include examples of work in a variety of content areas and to update their portfolio weekly. Because of the nature of an electronic portfolio they were able to include text documents, pictures, and even videos. They could record rug work and presentations that would typically not be able to be preserved. Learners were able to share their electronic portfolios with their family during Child's Work Night and Parent Partner Conferences.

Lastly, a variety of plans were put in place to increase emphasis on cosmic education and, therefore, provide context for all content areas. Cosmic education is the term Maria Montessori used to describe the study of how our universe has developed, from its creation to today. This exploration mainly encompasses cross-curricular studies in science, history, geography, and peace education, but also heavily draws upon math and language. Cosmic education provides context, is challenging, and greatly interests elementary children. I modified my presentation of Montessori's First and Second Great Lessons to provide depth appropriate for upper elementary and increase engagement. The First Great Lesson even took place outside of the school day under the stars to evoke a feeling of awe and wonder. Additionally, I partnered with the other upper elementary teachers at my school to provide dynamic afternoon cultural lessons. We each focused on a piece of the cosmic education scope and sequence (Duffy & Duffy, 2014): 4th year learners received lessons on the Coming of Man, 5th year learners received lessons on

Ancient Civilizations, and 6th year learners received lessons on U.S. History. Learners received one lesson each week and worked on research-based follow-up work between lessons.

Twenty-minute observations were conducted daily for ten weeks to track engagement during the work cycle. My co-teacher or I would observe for the following behaviors: working, state of flow, requested lesson, chose work (not required), receiving lesson, gave lesson to learner, wandering, asked to choose work, and adult chose work (Appendix C). Narrative notes were written to document in which activities children were engaging when in a state of flow.

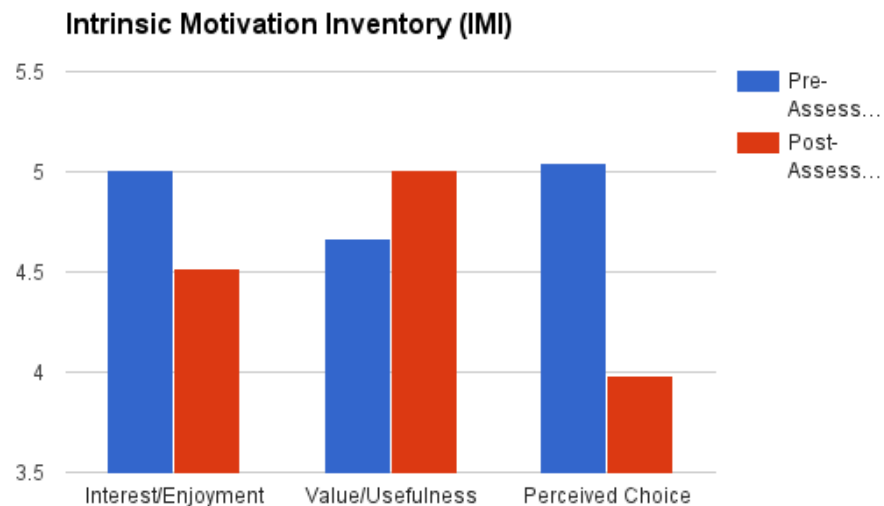
At the conclusion of the ten weeks, learners were given the same two pre-assessments, this time as post-assessments. They also responded to three journal questions designed to assess intrinsic motivation levels through a more narrative, open-ended format. Finally, I met with each child to gauge their feelings on work journals, advisory meetings, electronic portfolios, and cosmic education lessons. To guide these conversations, I asked specific questions related to each intervention.

### **Analysis of Data**

The Intrinsic Motivation Inventory (IMI) asked learners to select an activity from their morning work cycle and then rate a series of statements related to this activity using a number scale. They were free to choose any work from that week. Some chose a follow-up assignment from a lesson and others chose free-choice work not assigned by an adult. The scale began with 1 (not true at all) and progressed to 7 (very true). Combined responses indicated “interest/enjoyment level,” “value/usefulness,” and “perceived



choice” for the activity. In the pre-assessment, the average score for “interest/enjoyment level” was 5.01, while in the post-assessment it was 4.52. The pre-assessment average for “value/usefulness” was 4.67 and the post-assessment average was 5.01. Finally, “perceived choice” averaged at 5.04 for the pre-assessment and 3.98 for the post-assessment (see Figure 1).



*Figure 1.* Intrinsic Motivation Inventory results.

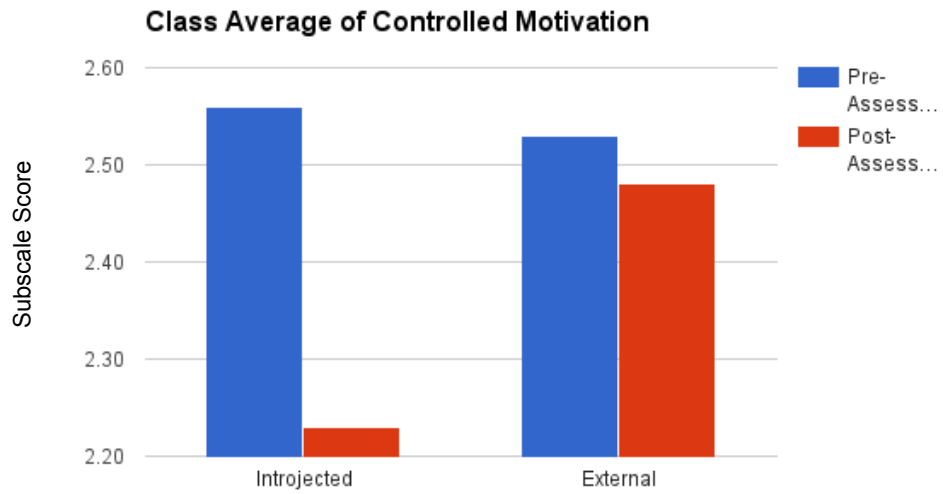
The results of the IMI assessment indicated that, on average, learners experienced less interest and perceived choice with the activities they rated at the conclusion of the study as compared to the start. However, they felt the activities had more value/usefulness. This may be attributed to the fact that only 34% of learners chose to do their pre-assessment on a lesson follow-up work assignment over “choice work,” while 71% chose to do their post-assessment on a lesson follow-up assignment. This variable would greatly affect perceived choice and also appeared to have an impact on the other two areas.

The second assessment, titled the Academic Self-Regulation Questionnaire (SRQ-A), measured each learner's level of the four types of motivation: external, introjected, identified, and integrated. External and introjected are considered controlled forms of motivation, while identified and integrated are considered autonomous forms. On the SRQ-A survey, seven to nine questions were dedicated to gauge each area. The following visual elaborates on the differences:

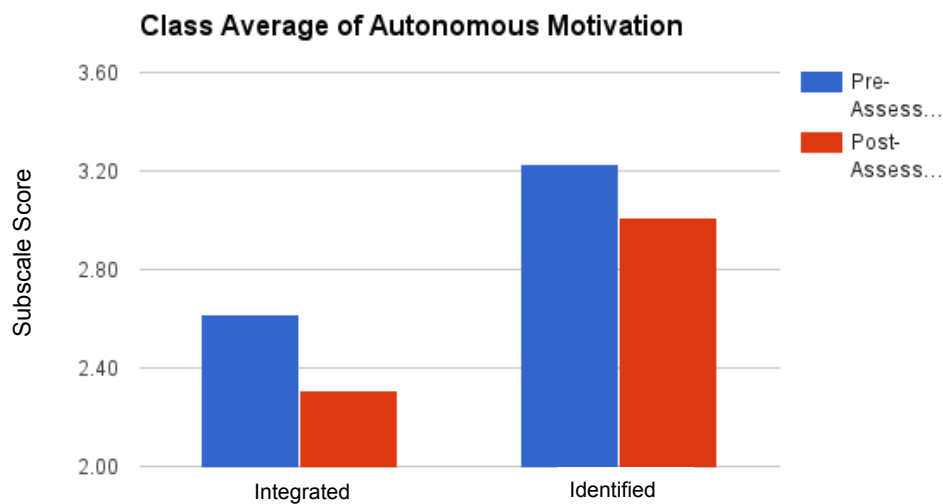
External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation
Behaving to gain some reward or avoid some negative contingency	Behaving out of a sense of guilt or obligation or a need to prove something	Behaving because of the importance one ascribes to the behavior	Behaving because the behavior is consistent with other goals & values
Losing weight to get a prize and/or recognition in a competition	Losing weight because one feels that obesity is a character flaw	Losing weight because a healthy weight is an important goal to accomplish	Losing weight because it is consistent with other health goals (e.g., lower cholesterol)

*Table 2.* The Four Types of Motivation.

The pre- and post-assessments indicated a decrease in both controlled and autonomous motivation levels. Learners may have experienced less extrinsic pressure as a result of using work journals rather than structured work plans. There was a particular decrease in introjected motivation, suggesting that learners experienced less guilt than at the beginning of the study (see Figure 2). It is interesting that, according to the survey, autonomous motivation levels also decreased (see Figure 3). This could be the result of a variety of factors and is unique to this survey, as qualitative data showed an increase in intrinsic motivation levels.



*Figure 2.* SRQ-A controlled motivation results.

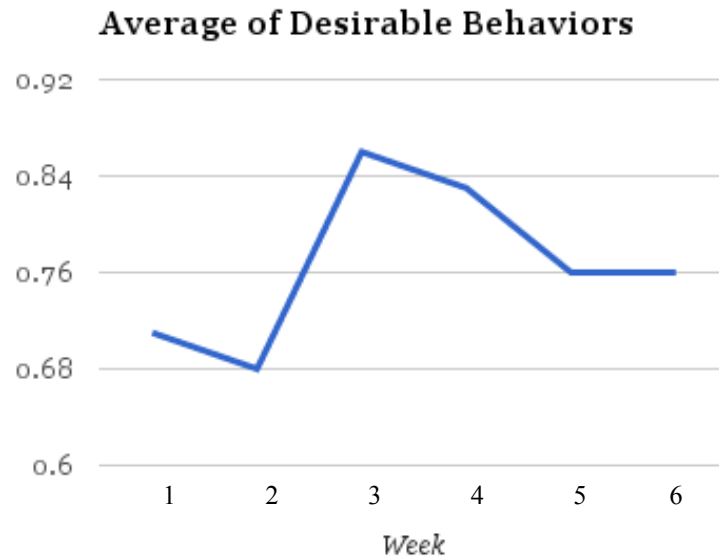


*Figure 3.* SRQ-A autonomous motivation results.

Daily 20-minute observations were made over the course of the study to gauge various behaviors during the work cycle. Although the observations took place over an eight week time span, learners were on break for two of those weeks. Therefore, six weeks of data was collected. My co-teacher and I used the observation form (Appendix C) to tally desirable and undesirable behaviors. Desirable behaviors included “working,”

“state of flow,” “requested lesson,” “chose work,” “gave lesson,” and “in lesson.”

Undesirable behaviors included “wandering,” “asked to choose work,” and “adult chose work.” The observations showed that desirable behaviors peaked during Week 3 (see Figure 4).



*Figure 4.* Observed desirable behaviors.

In addition, particular attention was giving to observing learners who reached a state of flow during the work cycle, as flow is the ultimate objective for intensely satisfying work. The number of learners engaged in a “state of flow” also reached its maximum during Week 3 (see Figure 5).

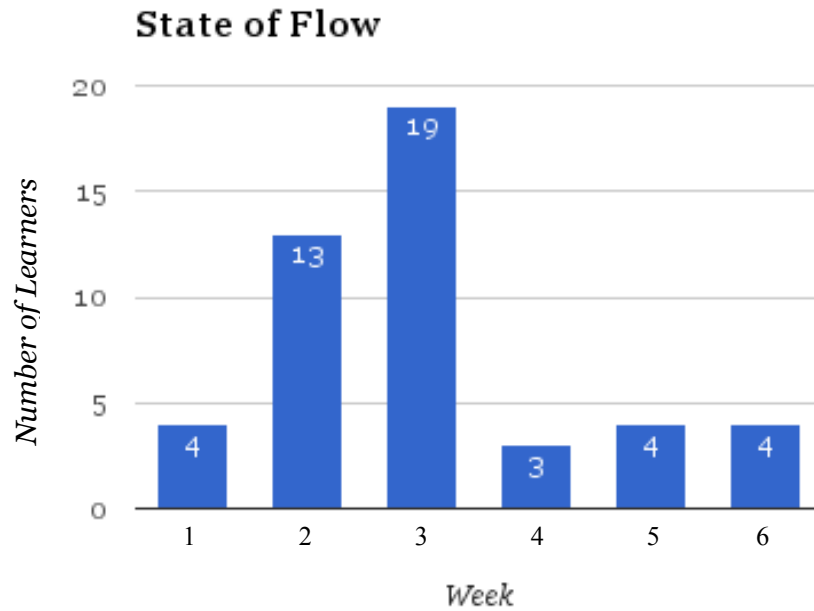


Figure 5. State of flow.

These observations caused me to refer back to my anecdotal notes to determine what types of activities were taking place during Week 3, when desirable behaviors and state of flow were at their highest. During this time learners were deeply engaged in child-initiated philanthropy projects. One group of children was working on planning, marketing, and executing a bake sale with proceeds benefitting the local homeless community. Another group started an herb garden and was researching how to create herbal teas, while a third group worked on a plot of land intended for produce. The idea of philanthropy was presented to the learners as part of their cosmic education studies in an effort to help them connect to their community. Therefore, it is reasonable to assume that cosmic education played an important role in increasing desirable behaviors and opportunities for flow during Week 3 of the study.

At the conclusion of the study learners were asked to respond to six interview questions to assess their feelings on portfolios, work journals, conferences, and cosmic

education studies. An outside volunteer presented the questions and recorded the responses so learners would not feel pressured to respond in a certain way in the presence of their teacher. The first two questions, centered around portfolios, revealed that the majority of learners enjoyed the process of creating their portfolio and felt it helped them to do their best work (see Figures 6 and 7).

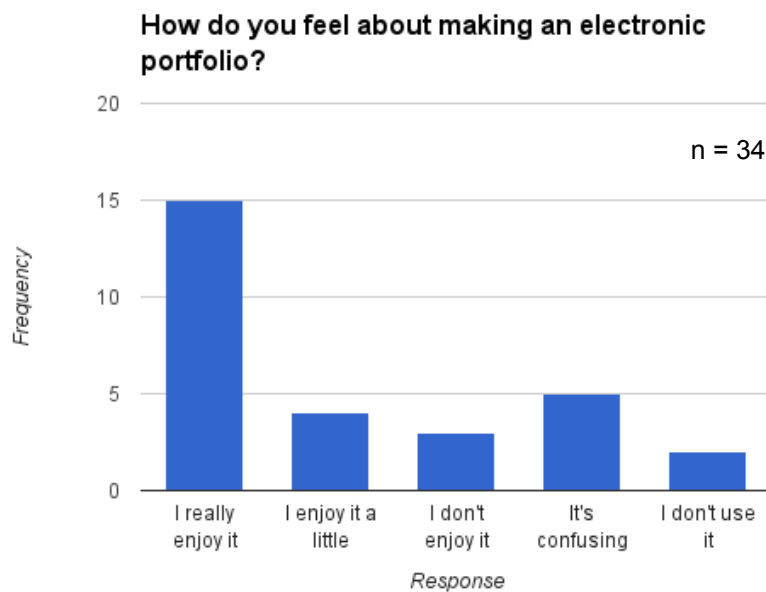


Figure 6. Learners' feelings on electronic portfolios.

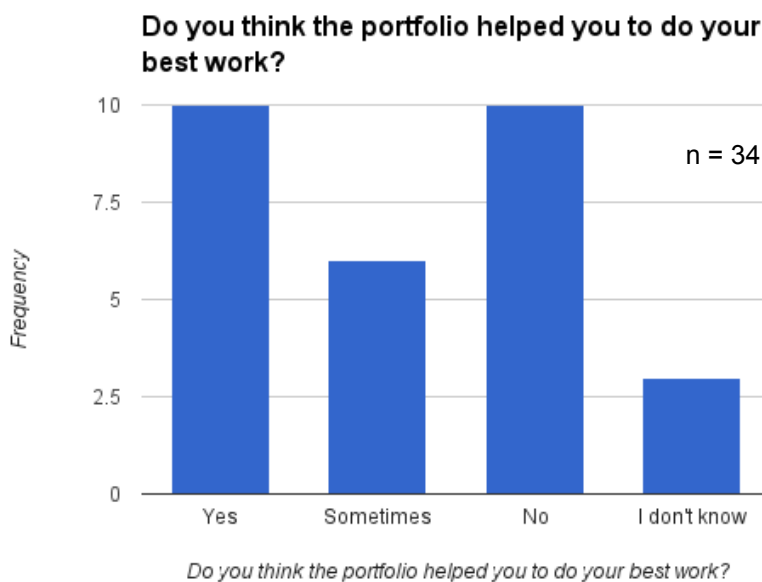
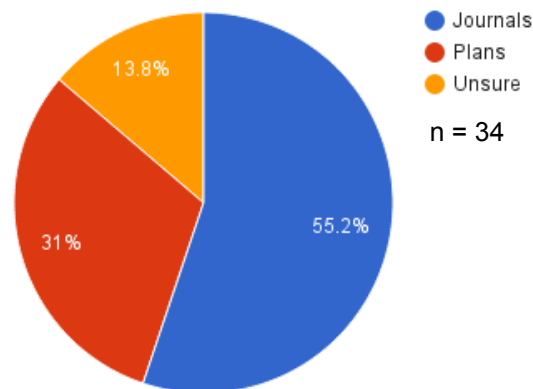


Figure 7. Perceptions on how portfolios influence work quality.

It is important to note that the learners created electronic portfolios through an online platform rather than traditional portfolios. Some learners expressed that the process was confusing, and others did not use the portfolio at all. Most of the learners greatly enjoyed working on computers regardless of the objective. This may have influenced their level of perceived enjoyment when adding to their portfolio.

The next interview question asked learners their thoughts on recording in work journals rather than filling out work plans. Fifty-five percent of the learners preferred work journals, while thirty-one percent preferred work plans. Fourteen percent of the learners were unsure or did not have a preference. Half of the learners who were unsure were new to a Montessori environment and had never used a work plan before, so they were unable to make a comparison (see Figure 8).

**Preference of Work Journals and Work Plans**

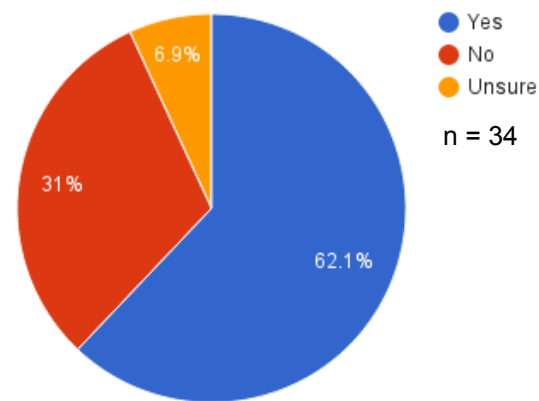


*Figure 8.* Preference between work journals and work plans.

Learners were also asked if they felt it was helpful to have a weekly or bi-weekly conference with one of their teachers. Sixty-two percent of learners felt the conferences were helpful, thirty-one percent felt that they were not, and seven percent of learners

were unsure (see Figure 9). Within their responses several learners expressed that they felt the conferences helped them to know what they were ready to work on next. A few learners indicated that the conferences were helpful for their family to stay informed, since conference notes were kept on a live Google document shared with family members.

**Are weekly or bi-weekly conferences helpful?**

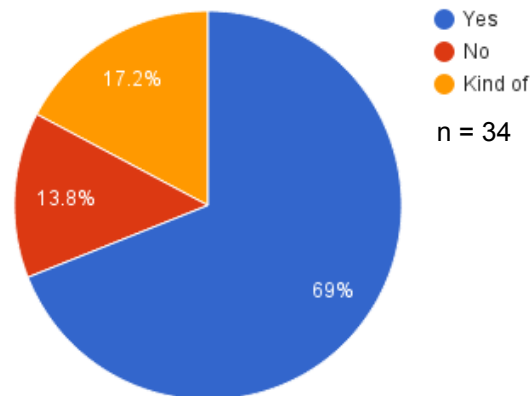


*Figure 9.* Are weekly or bi-weekly conferences helpful?

The last interview questions centered around perceptions of cosmic education studies. Learners were asked if they enjoyed learning about the universe, Earth, and history of life on Earth. Eighty-six percent indicated that they either kind of liked or really liked these studies (see Figure 10). Learners were also asked if they felt the studies of the universe, Earth, and history of life on Earth were important. Seventy-nine percent said they were important, fourteen percent said they were not, and seven percent were unsure (see Figure 11).

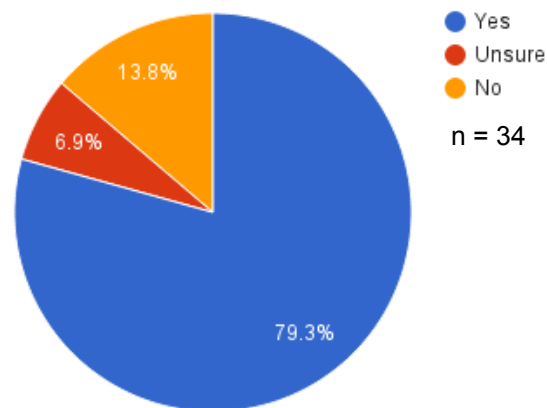


**Do you enjoy learning about the universe, Earth, and the history of life on Earth?**



*Figure 10.* Learners' enjoyment of cosmic education studies.

**Do you think it's important to learn about the universe, Earth, and the history of life on Earth?**



*Figure 11.* Perceived importance of cosmic education studies.

After carefully examining the data that I gathered throughout this project, I was able to make a few conclusions. Although the IMI pre- and post-assessment data indicated a decrease in interest/enjoyment level and perceived choice, feelings on value/usefulness increased. This can be attributed to the fact that learners overwhelmingly considered a follow-up work assignment over free-choice work when taking the post-

assessment, when they did not with the pre-assessment. They therefore recognized the importance of practicing materials presented in lessons, even though they did not enjoy it as much as self-selected work.

The SRQ-A assessment data showed a decrease in both controlled and autonomous levels of motivation. It is possible that the use of work journals contributed to fewer feelings of guilt and external control. Although, according to the assessment autonomous motivation levels also decreased, teacher observations showed an increase in desirable behaviors. The particularly high levels of engagement and flow in Week 3 directly correlated with child-initiated work (philanthropy projects) built on a foundation of cosmic education.

Responses in learner interviews overwhelmingly supported the interventions put in place at the beginning of the study. Learners clearly enjoyed the electronic portfolio process and felt it helped them set high expectations for their work, although the technology component was fun for some and daunting for others. Work journals were clearly preferred over work plans, and weekly/bi-weekly conferences were perceived as helpful for nearly two-thirds of the learners. Finally, cosmic education studies were perceived as both enjoyable and important. This feedback supports the continued use of electronic portfolios, work journals, and conferences, as well as a continued emphasis on cosmic education. Going forward, I will use this information to put additional support and modifications in place for learners who felt that the interventions were not helpful.

### **Action Plan**

When children are given an appropriate level of choice, engage with interesting content, have opportunities for collaboration, and are challenged they cultivate a deeper love for learning (Duffy & Duffy, 2012). My action research project interventions bolstered each of those areas. Results of my research showed that learners enjoyed and benefitted from the changes, and I will continue to implement them consistently.

Moving forward, I intend to make some adjustments that will make the interventions even more relevant for learners. One out of three learners expressed that they preferred work plans to work journals, so I will meet with these children to get additional feedback and modify the process as needed. They might benefit from a more customized middle-ground between work plans and work journals. Additionally, the technology component of electronic portfolios was a source of frustration for a small number of children, and I feel they may benefit more from a traditional portfolio. I will work with them to create and maintain a hard copy collection of their best work so they are still able to capitalize on the portfolio process. In regards to regular conferences, 10 out of 34 children expressed that they did not find them to be very beneficial. I would like to have a round table conversation with these learners, specifically, to discuss how we can make the meetings more relevant, helpful, and productive. The increased emphasis on cosmic education was enjoyed by nearly everyone and we will continue our work in that area. Because of the spike in engagement during week three of my observations, I also want to redouble my efforts to support their personal philanthropy initiatives.

I found the comparison between my pre- and post-assessments to be inconsistent with the rest of my data. If repeating the process, I would make some changes to eliminate possible variables. The Intrinsic Motivation Inventory (IMI) asked learners to answer questions based on an activity. I allowed learners to choose any morning work to focus on, which resulted in a wide variety of choices and inconsistency between their pre-assessment selection and their post-assessment selections. Alternatively, I would have learners choose the same work for the pre- and post-assessments. Or, I would specify that everyone select “choice work” rather than a follow-up assignment. If repeating the action research I would also be more deliberate about the timing of the assessments. I gave the pre-assessments at the conclusion of a productive work day, and I gave the post-assessments on a Monday morning. It would be preferable to sync the timing of both assessments as an added consistency.

There are several available platforms for additional action research to shed even more light on supporting intrinsic motivation. Each of the four interventions (work journals, portfolios, conferences, and cosmic education) is an opportunity for deeper, more extensive research. I intend to focus on each of these interventions in turn to maximize their effectiveness. Further attention can also be given to the effects of philanthropy on student engagement, considering the dramatic increase in desirable behaviors when community service initiatives were at their peak. Also, it would be interesting to observe how work journals, portfolios, conference, and cosmic education specifically impact children with special needs.

As Montessori teachers, it is important that we are consistently evaluating and reevaluating our practices. With the demands of societal and legislative expectations, it can be easy to neglect student engagement in favor of meeting academic or behavioral benchmarks. Work journals and regular conferences are ways to partner with learners to increase challenge and choice while maintaining student-centered academic rigor. Portfolios give learners the opportunity to monitor and share their development. Cosmic education provides the foundation for every subject and can bring additional interest and relevance to content areas. Together, their consistent implementation fosters joyful, intrinsically motivated learners.

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**Appendix A**  
Intrinsic Motivation Inventory (IMI)

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The following items concern your experience with a task. Please answer all items about a work (of your choice) that you did this week during the work cycle. For each item, please indicate how true the statement is for you, using the following scale as a guide:

1      2      3      4      5      6      7  
not at all true    somewhat true                          very true

Activity: \_\_\_\_\_

1. I believe that doing this activity could be of some value for me.
2. I believe I had some choice about doing this activity.
3. While I was doing this activity, I was thinking about how much I enjoyed it.
4. I believe that doing this activity is useful for improved concentration.
5. This activity was fun to do.
6. I think this activity is important for my improvement.
7. I enjoyed doing this activity very much.
8. I really did not have a choice about doing this activity.
9. I did this activity because I wanted to.
10. I think this is an important activity.
11. I felt like I was enjoying the activity while I was doing it.



12. I thought this was a very boring activity.
13. It is possible that this activity could improve my studying habits.
14. I felt like I had no choice but to do this activity.
15. I thought this was a very interesting activity.
16. I am willing to do this activity again because I think it is somewhat useful.
17. I would describe this activity as very enjoyable.
18. I felt like I had to do this activity.
19. I believe doing this activity could be somewhat beneficial for me.
20. I did this activity because I had to.
21. I believe doing this activity could help me do better in school.
22. While doing this activity I felt like I had a choice.
23. I would describe this activity as very fun.
24. I felt like it was not my own choice to do this activity.
25. I would be willing to do this activity again because it has some value for me.

**Appendix B**  
Academic Self-Regulation Questionnaire (SRQ-A)

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**WHY I DO THINGS**

Name: \_\_\_\_\_ Age: \_\_\_\_\_

Grade: \_\_\_\_\_ ( ) Boy or Girl ( ) Teacher: \_\_\_\_\_

**A. Why do I do my homework?**

1. Because I want the teacher to think I'm a good student.

Very true      Sort of true      Not very true      Not at all true

2. Because I'll get in trouble if I don't.

Very true      Sort of true      Not very true      Not at all true

3. Because it's fun.

Very true      Sort of true      Not very true      Not at all true

4. Because I will feel bad about myself if I don't do it.

Very true      Sort of true      Not very true      Not at all true

5. Because I want to understand the subject.

Very true      Sort of true      Not very true      Not at all true

6. Because that's what I'm supposed to do.

Very true      Sort of true      Not very true      Not at all true

7. Because I enjoy doing my homework.

Very true      Sort of true      Not very true      Not at all true

8. Because it's important to me to do my homework.

Very true      Sort of true      Not very true      Not at all true

**B. Why do I work on my classwork?**

9. So that the teacher won't yell at me.

Very true      Sort of true      Not very true      Not at all true

10. Because I want the teacher to think I'm a good student.

Very true      Sort of true      Not very true      Not at all true

11. Because I want to learn new things.

Very true      Sort of true      Not very true      Not at all true

12. Because I'll be ashamed of myself if it didn't get done.

Very true      Sort of true      Not very true      Not at all true

13. Because it's fun.

Very true      Sort of true      Not very true      Not at all true

14. Because that's the rule.

Very true      Sort of true      Not very true      Not at all true

15. Because I enjoy doing my classwork.

Very true      Sort of true      Not very true      Not at all true

16. Because it's important to me to work on my classwork.

Very true      Sort of true      Not very true      Not at all true

**C. Why do I try to answer hard questions in class?**

17. Because I want the other students to think I'm smart.

Very true      Sort of true      Not very true      Not at all true

18. Because I feel ashamed of myself when I don't try.

Very true      Sort of true      Not very true      Not at all true

19. Because I enjoy answering hard questions.

Very true      Sort of true      Not very true      Not at all true

20. Because that's what I'm supposed to do.

Very true      Sort of true      Not very true      Not at all true

21. To find out if I'm right or wrong.

Very true      Sort of true      Not very true      Not at all true

22. Because it's fun to answer hard questions.

Very true      Sort of true      Not very true      Not at all true

23. Because it's important to me to try to answer hard questions in class.

Very true      Sort of true      Not very true      Not at all true

24. Because I want the teacher to say nice things about me.

Very true      Sort of true      Not very true      Not at all true

**D. Why do I try to do well in school?**

25. Because that's what I'm supposed to do.

Very true      Sort of true      Not very true      Not at all true

26. So my teachers will think I'm a good student

Very true      Sort of true      Not very true      Not at all true

27. Because I enjoy doing my school work well.

Very true      Sort of true      Not very true      Not at all true

28. Because I will get in trouble if I don't do well.

Very true      Sort of true      Not very true      Not at all true

29. Because I'll feel really bad about myself if I don't do well.

Very true      Sort of true      Not very true      Not at all true

30. Because it's important to me to try to do well in school.

Very true      Sort of true      Not very true      Not at all true

31. Because I will feel really proud of myself if I do well.

Very true      Sort of true      Not very true      Not at all true

32. Because I might get a reward if I do well.

Very true      Sort of true      Not very true      Not at all true

